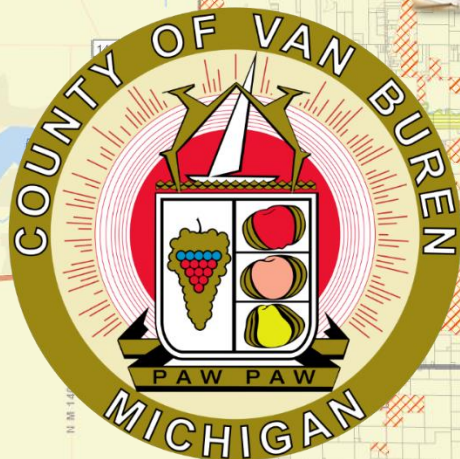


Rural Broadband Inventory Survey

Van Buren County Board of Commissioners



Prepared by **DCS Technology Design**

July 26th, 2022

Amended September 13th, 2022





Amendment

This document was originally published in July of 2022, and then amended to include updated information in Arlington, Columbia, Pine Grove and Antwerp townships regarding additional USDA funding that was awarded but inadvertently omitted from the July version. This impacted the summary pages for Commissioner Districts #2 and #3, the individual township summaries for each of the four townships mentioned, and the budget summary on page 12. All other information remains unchanged.



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History (Literally)

Fact: Based on the 2020 US Census, geographically, 97% of the United States is Rural, but only 14% of the population lives in rural areas.

On July 4th, 1861, President Abraham Lincoln was speaking to a Special Session of Congress, when he said [the purpose of government was] *“to elevate the condition of men - to lift artificial weights from all shoulders - to clear the paths of laudable pursuit for all - to afford all, an unfettered start, and a fair chance, in the race of life”*. Less than a year later, he signed the Homestead Act, which offered free land for those willing to move to it and cultivate it, *an unfettered start, and a fair chance, in the race of life*.

The World's first Hydroelectric Power Plant went online in 1882, and by the 1920's, electricity had become a common convenience in all major urban areas. However, electricity was still not being distributed to rural areas because of the general belief that the infrastructure would be cost prohibitive. Even though, in that era, it was increasingly evident that electricity had become more than just a convenience, it was becoming an essential utility *“in the race of life.”*

There were many individual efforts throughout the 1920's and into the 30's to test the economics and viability of how electricity could be distributed throughout all rural areas. But it wasn't until 1933 that the Tennessee Valley Authority (TVA) was created (motivated not so much to get electricity to rural areas, but rather to create jobs), and then in 1935, the Rural Electrification Administration was established, which led to the Rural Electrification Act of 1936. In 1939, that act became a department of the United States Department of Agriculture (USDA) and was charged with administering loan programs for electrification (and by then, telephone service) in rural areas. The USDA (along with other government departments) continue to sponsor similar grants and loan programs for rural needs today. But how are they doing?

The Homestead Act, and the Rural Electrification Act were both pivotal points in the history of Rural America, which were meant to give all Americans *“a fair chance, in the race of life.”* 100 years have gone by since electricity progressed from a luxury convenience to an essential utility, and our country today is at another pivotal moment.

Following a remarkably similar timeline as the evolution of electricity, in the early 1980's, a government experiment called ARPANET was developing and adopting the protocols that would enable their research to become the Internet as we know it today. Curious though that in today's technology age, when so many technological advancements develop so rapidly, that the progression of Internet in Rural America looks so much like electricity's progress a century ago, when times were thought to be less hurried. Is it going to be 2036 before Rural Broadband becomes a priority?



Unpredictably, since the beginning of 2020, the world has experienced challenges unlike anything today's generations have ever seen. We can look at history and reflect on similar challenges from the past, but not much from those times are applicable to these most recent tests. Questions that have been in the works for several years, have suddenly taken on new importance, and Broadband Internet to Rural America is topping that list. Broadband Internet is taken for granted in Urban America (which is only 3% of the geography). But (sadly) it took a pandemic to realize how isolating "living in the country" could be, when, without access to basic internet services, it can have such an impact on your livelihood, education, health, and welfare. Access to high speed, reliable internet has become perhaps even more important to Rural America today, than electricity was just 100 years ago. The past two and a half years have proven that, finally making it one of Americas top priorities.

In 2022, the county leadership for Van Buren County, Michigan, took the initiative to address the problem of Rural Broadband in their county, and this report was developed to provide the foundation to achieve their goal for broadband to 100% of the county's residents and businesses within the next few years. Today, Van Buren County has more than 10,000 parcels (~25% of the Counties occupied parcels) without access to reliable High-Speed Broadband. There are federal and state programs that have started that will reach about 3900 of those parcels, but still leaving over 6000 without any plans for Broadband access in the future. This report provides the framework to develop the plans that will fund and build Broadband to everyone in Van Buren County.



Overview

The USDA has traditionally been the branch of the US government most committed to the development of Rural America. Through programs like Reconnect, a Broadband loan and grant program (and a descendant of the Rural Electrification Act of 1939), the USDA continues to pursue the development of Rural Broadband. The Federal Communications Commission (FCC) has also joined the government resource pool for Rural Broadband funding through programs like Connect America Fund (CAF and CAF II) and the more recent Rural Digital Opportunity Fund (RDOF). To continue the momentum of RDOF and help address many of the lessons learned from these efforts, the federal government has continued to develop programs and create more funding opportunities for Broadband, (i.e., America Rescue Plan Act, or “ARPA “ and Broadband Equity, Access and Deployment Program, or “BEAD”) and the data contained in this report is exactly the information that is now being sought to qualify and quantify the level of funding needed. But still, is it enough?

Although this study does not directly address the funding requirements, estimated budget ranges have been calculated based on current industry activity around the state and region. It is intended to provide a more precise set of data to help target funding sources more precisely and serve as a tool to better coordinate efforts between government, municipalities, and ISPs.

Today, Fiber Optics is the preferred performance technology, and in most cases, the most economical over the long term. Up until recently, when new funding opportunities started taking shape, other technologies were being considered more closely, at least for the short term. But now, with some exceptions, all new funding sources are intended for fiber optic infrastructure for currently unserved areas. In unserved areas that are in proximity to current Hybrid Fiber/Coax networks, or HFC (Cable), exceptions are being made for short extensions off existing cable systems since that technology (contrary to what many are claiming) can meet the minimum speed and scalability requirements. Beyond that, some extreme situations may be considered for other technologies, but the justification process will be extensive, and will likely only be considered in the most remote and rural parts of the country. The sidebar, “Technology Life Cycle,” provides an overview of why fiber has become the de-facto standard for all new funding efforts for rural broadband.

There are several sources that provide some level of service area reporting, and recently the federal government has pushed to find more accurate means to quantify and measure internet availability and performance across large geographic areas. All these efforts do provide some value, but they still leave gaps in the information that are difficult to fill, or even define. Many of the on-line surveys rely on the technical ability of the consumer, often asking questions that are not easy to answer accurately, reducing the viability of the data being collected. Also, a paradox of some of these surveys is that they are online

Technology Life Cycle

What does Technology Lifecycle mean, and why is it important to Rural Broadband Planning? Basically, part of planning for any long-term investment into a telecommunications technology should consider how long a technology, or parts of it will remain useful, and what kind of costs should be planned for when it is time to refresh or replace the systems or its parts.

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based, making the fundamental question of “How good is your Internet” somewhat meaningless when those that have no internet, do not have the access they need to be able to respond to such a question.

Another example of a self-reporting source for Broadband Access is the FCC Form 477, which relies on the ISPs to self-report their service areas twice a year. Since Form 477 has been a key resource for funding activities (RDOF) in Van Buren County, we will dig a little deeper into that issue in the next section.

This study does not use any self-reporting survey methodologies by Internet Users, Internet Providers, Government Agencies, or other service providers. All the data we collect is done through physical survey of the whole county, by personnel experienced in the technologies we report on, and through interviewing the ISP’s, gaining valuable insight from them. Performance parameters, when included in the report, are based on technical specifications and standards of the technologies we have identified. As such, due to the many variables that can affect performance, much of the data may not represent actual performance, but rather expected performance. We feel that this is the correct approach to reporting certain performance characteristics of the different technologies, since actual performance may be an indicator of undetected problems within a technology or service area, which might be being assumed as normal, but actually a separate issue that needs the attention of the service provider.

The study provides Van Buren County a report-based framework that can be used to help decision makers in the planning and working with potential funding sources and ISP’s. It is an accurate snapshot of what technologies are available, and some of what is being planned, across the county, down to the parcel level. Following are technical descriptions, charts, and most important, Geographical Information Systems (GIS) based maps of the entire county showing a very precise inventory of what is available to businesses and homeowners. The maps provide a level of detail and granularity that is not typically available elsewhere, and the accompanying GIS data files are being made available to the County for their use (more on this below). The report is technical in nature but compiled in a format that is hopefully informative and easy to understand for all readers.

Technology Life Cycle – cont. Telephone

If you are older than most “Millennials,” then you have likely witnessed the end of the “landline” and a shift to cellular. However, the copper wires that used to connect that old telephone (even the ones with dials) are still there, and in many cases, are still being used for your home phone calls today. Yes, we mean the calls from your “Smartphone.”

There are still far more copper telephone lines in place today, especially in rural areas, than any other media, and much of it is likely 40 to 50 (or more) years old. When copper lines were first built, they were meant to support just analog telephones. When digital phones came out, with a little tweaking, the same copper wire worked for them. Then, as the “World Wide Web” began to catch on, it was figured out that, with a little more conditioning of those same copper wires, higher capacity digital technologies like “ISDN” and “DSL” could still use the same wire (which not only brings higher speed data services, but also supports services like “Voice over IP” and Wi-Fi calling on your smartphone, from inside your home). But the bandwidth and distance limitations of twisted pair copper wires have been pushed to their limits, and digital technologies, like DSL that depend on old telephone wires, can no longer compete with newer, and higher speed technologies. So, it is unlikely to see any substantial new construction for copper telephone lines in the future. But the history of this infrastructure establishes a good basis for predicting the lifecycle potential of the next two technologies. So, although it is nearing the end of widespread use, the copper twisted pair cabling used to support a variety of different technologies for over a century, established that we can build a cabling infrastructure outdoors, that can be adapted to technology changes, and not have to be replaced for 50 or more years.

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The Technologies

There are basically only two technologies that can be considered for current and emerging government funding programs. Hybrid Fiber Coax, or HFC (Cable TV) and Passive Optical Networks (PON's), more commonly known as Fiber to the Home (FTTH). Both HFC and FTTH based networks provide the highest level and most consistent performance throughout their service areas. Fiber is also becoming the most economical to build, with the longest expected lifecycle. Both Cable and Fiber are scalable technologies that can support increasing capacity demands for many decades. For example, Cable TV has existed in the area since the 60's and 70's, and parts of that coax infrastructure is still in service and will continue to scale and evolve with demand for many years to come. However, most new construction for any cable or internet provider is being planned with fiber optics. Much like Cable has done for the last 50 years, today's Fiber technology will provide an infrastructure that will last the next 50 years, or more. The current capacity being delivered by fiber to the home does not begin to tap the capacity of the fiber itself. In experiments, the capacity of the type of fiber optic cable being installed in homes today, has been demonstrated to be 100,000 times the 1 Gb/s speeds being offered in current Fiber to the Home services. And since the fiber systems themselves are mostly passive, meaning no electrical devices needed between the transmission and receiving equipment, the operational costs are far more economical than any copper-based infrastructure. Future upgrades will only need to be in the electronic equipment at the ends of the fiber.

Until the most recent funding opportunities have been announced, programs like RDOF, Reconnect, CAF II and others have funded technologies like twisted pair copper based Digital Subscriber Line (DSL) and several wireless technologies. However, ARPA, BEAD and others are steering away from anything other than FTTH and HFC, with a strong preference for FTTH. Other technologies may be considered in some extreme cases but will require extensive justification. This study therefore is focused only on existing HFC and FTTH areas in Van Buren County, with the intent to reach all unserved areas in the near future with FTTH. There will be some exceptions where HFC will be considered for future funding, but only in cases where it is an extension off existing HFC systems and is intended to service single or small groups of unserved parcels and can be shown to be more economical than bringing fiber to the area.

Technology Life Cycle – cont.

Community Antenna Television (CATV)

CATV, or Cable TV began to emerge in 1948, and ironically, was first built only in rural areas. Since TV sales were dependent upon being able to pick up a broadcaster's signal, TV shops were stringing wires from their "Community Antennas" to homes that could not get a good signal because of their location out in the country or in the mountains. By the 60's, the technology had developed and standardized on using Coax Cable which became the basis for all Cable TV systems today. It wasn't until the end of the 70's, that a boom in Cable TV construction started in urban and suburban areas. Metropolitan areas did not really have a need for cable since TV broadcasters were mostly transmitting from towers within those areas, and simple antennas at your home picked up the three or four channels that were available. But as satellite TV and other broadcast options started to emerge, Cable became a lucrative business opportunity. The systems quickly evolved from 12 channel systems to 160 or more channels in just a few years, all using analog technology, on Coax cable. The Coax had the bandwidth capacity to support that expansion. Since then, Cable TV has seen a migration to all digital formats, providing literally 100's of channel options, and more importantly, the inclusion of Cable Modem, bringing the first real high speed Broadband Internet into homes and businesses. A lot of areas are still functioning with the same Coax that was strung on poles and buried in neighborhoods in the 70's and 80's, with changes only in the active electronic components, and the technologies at either end. This has proven that Coax based Broadband infrastructure, like its twisted pair predecessor, is robust enough to last and evolve 40 to 50 years.

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The Report Structure

The data in this report was collected and constructed using GIS tools and technology, which allows the data to be presented using tables, graphics and most important to the intent of the report; maps, with the data itself compiled in an underlying database. This allows the data, and the maps to be easily maintained and updated as needed. It can be configured for myriad purposes and integrated into other GIS systems for even greater functionality. The foundation layer of the maps is the GIS property maps for all Van Buren County. Through a physical survey of practically every road mile, available and planned technologies have been identified and plotted. It is supported by additional information about the technologies, with information on how some should be performing, and how some are actually performing. Due to the magnitude of data compiled, not all the information is visible in the PDF version of this study but can be zoomed in and viewed using various GIS applications. The county will determine how this data is shared.

The maps have two general feature categories, parcel type and service provider information. On top of the base layer maps provided by the county, layers have been added to show the following features:

- Unoccupied (no address) – Parcels that have no occupiable structures and no registered address and may include wooded areas (including state or federal park or preserve areas), farmland, vineyards, orchards, wetlands, and other areas that have no current requirement for Broadband Services.
- Undeveloped (address) – Parcels that are not occupied and no apparent development underway but have had an address assigned to the parcel. These properties could be planned for development in the future but are not considered for current Broadband Planning. Subdivisions or other developments that have obvious development ongoing, even if there is no occupancy yet, are classified as “Unserved” so that any new Broadband planning can include them in the near future (see “Unserved” next).

Parcel Key

Unoccupied (no address)	
Undeveloped (address)	
Unserved	
Agricultural (unserved)	
Community	
Schools	
Parks/Public Spaces	
Commercial/Industrial	
Healthcare/Hospitals	
Marinas/Docks	
Cemetery	

Technology Life Cycle – cont. Passive Optical Networks (Fiber)

Passive Optical Networks (PON's) are likely the most common new build being deployed today, and it is being built by all types of ISP's, Cable TV companies, Telephone Companies, and private operators for just about every type of communication requirement there is. There are a lot of technical variations to the PON, but like Twisted Pair and Coax, the key factor relative to Lifecycle is the ability to support all of today's variations of the technologies, and easily migrate and support future technologies.

The designs for most PON configurations are quite simple, much like the old, twisted pair designs for telephone. Basically, there is a dedicated fiber (or two) from the main host location to each end point (your home for example). A single strand of fiber can be a dozen or more miles long, and still deliver the full-service offerings reliably to each subscriber. The word “Passive” in PON means that the only electricity needed to make a connection, is the electricity at the transmitter, and the electricity at the receiver. Everything in between is un-powered, light waves passing through a glass fiber. Bundles of these fibers are bound together using the same materials and constructed with the same methods that have been proven on copper and coax-based systems for over a century. So, based on that similarity alone, today's fiber will easily last 50 years into the future. Since it is passive, upgrading to future technologies, is simply just changing the electronics at either end. Further, the fiber optic glass being used today has been tested in the lab to reach more than 100,000 times the gigabit capacity being delivered to most fibered homes today. From an infrastructure, and performance view, the lifecycle of a fiber should easily extend to, and perhaps well beyond 50 years.

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- Unserved – Parcels that have no access to Cable or Fiber are identified as un-served. Some of these parcels may have access to DSL, or some type of wireless technology for Internet, but none of these technologies are considered high speed Broadband by current standards, and therefore considered eligible for many of the current and emerging Broadband Grant programs.
- Agricultural (unserved) – Rural farming households and operations that do not have access to Broadband services are identified and classified as “Unserved Parcels” in this study. This assures that all farming operations have a point of access to Broadband Internet Services to support their Cloud based and online Ag-Tech application requirements. Larger cultivated parcels that are not contiguous to the main farm operations but are currently registered with an address and electrical services which support some type of farming function (i.e., irrigation systems), are identified as “Agricultural (unserved).” Agricultural Technology is a critical subject for Van Buren County, and the intent of this study is to assure that access to Broadband Service is available directly to all Farming operations in the county. But if the only purpose for building fiber on some roads is to reach an irrigation system, then those parcels have been identified separately so that additional research can be done to justify the expense. Agricultural (unserved) parcels are included in the count of all unserved parcels for budget estimating.
- Community Parcels – Township Halls, Police, Fire Departments, Libraries, and other “Community Anchor Institutions” have been separately identified for future planning purposes. Community Parcels are classified as “served” unless otherwise indicated on the maps as a “Gap Parcel.”
- Schools – All schools are considered served but have been identified separately so that this tool may be used for future educational network planning.
- Parks/Public Spaces – Identified separately and are classified as “serviceable” but may require special consideration if having service to them is a requirement.
- Commercial/Industrial/Healthcare – Industrial Parks, Commercial Districts, Hospital campuses, and other large businesses are classified separately since they will typically have multiple

Technology Life Cycle – cont. Wireless Technologies

The lifecycle of wireless technologies is a little different than wired infrastructure, mostly because wireless is the air around us, which will never change. So, when upgrading to the next generation wireless, pretty much everything is replaced. But, unlike wired, the old stuff does not necessarily go away, it can continue to co-exist with the new. The best example is 3G Cellular, which has seen two major transitions (4G and 5G), with several sub-categories each. Although no longer mainstream, 3G continued to support so many requirements for over 20 years, but in 2022, it too has been finally retired.

When a new family of wireless technologies emerge, there are a couple of common elements that may be re-usable, Towers, and the Fiber Infrastructure that connects them. Yes, even with wireless, we must be thinking about how it all connects, and today that is Fiber. We already mentioned that Fiber can last 50 years, and the other element, Towers, can also last that long if properly maintained. Pretty much everything else, including the antennas, will be replaced. We know that the old doesn't always go away, but as consumer demand continues to grow, we must make room for the new.

3G was the first cellular “Broadband” standard, introduced 2000. Variations of 4G started in 2010, and 5G has been the promise since before 2020. 6G is in the labs already, but will it be 2030 before we see it?

IEEE 802.11 is the Standards Body that is more widely known as “Wi-Fi.” Since its first two published standards in 1999 (A&B), it has gone through 4 more “generational” updates, and today is at 802.11AX, or now known as “Wi-Fi 6” (for the 6th Generation). But like cellular, the old doesn't always go away. Most of the Wi-Fi services still being offered in outdoor wide area applications is Wi-Fi 4, or 802.11N. But new generations of Wi-Fi seem to follow a 3-to-6-year cycle.



commercial options for Internet and Business Networking requirements. Commercial parcels are identified as served, but not specified by service provider.

- Other parcel classifications – For the purpose of accuracy, there are 50,797 parcels in the County GIS database that need to be categorized. Some parcels such as docks and cemeteries do not necessarily fit in the general served/unserved categories, so they are identified separately so that the total number of parcels in the county can be validated.
- Gap Parcels** (Important) – All occupied parcels that are classified as unserved and are not in an area funded by RDOF or Reconnect. Due to the ambiguity of how the RDOF areas are drawn, we have developed this layer to identify where current funding stops more precisely, and where additional funding is needed to reach all unserved occupied parcels.
- Service Provider – Each parcel that is serviceable by Cable or Fiber is identified by provider. In some cases, a single parcel may have two or three providers available, which are indicated by multiple colors.
- Existing Cable Service Areas – (Comcast, Charter, Sister Lakes Cable, Mediacom) All coax-based networks that can currently support the minimum standard of 100 Mbps download and 20 Mbps upload speeds, meeting current minimum requirements for ARPA and BEAD. All these areas are potentially scalable to gigabit speeds which is an additional requirement for funding any extensions on this type of network.
- Existing Fiber Optic Networks – (MEC, BCI, AT&T) using different transmission methods, all fiber networks in this report are capable of Gigabit speeds and scalable to multi-gigabit speeds in the future, meeting all technical requirements for current funding programs.
- Grant Funded Areas – Layers showing where Rural Digital Opportunity Funds (RDOF) and USDA Reconnect Funds are being applied to currently unserved areas. The Reconnect program being built by Bloomingdale Communications mostly in Geneva Township is identified to the parcel level and is under construction now. The RDOF areas throughout the county are shown based on Census Blocks, and do not necessarily align with parcel level property lines, and may cover existing serviced or unoccupied parcels, making some locations ambiguous (see Gap Parcels above).

Service Provider Key

Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



The Summary

This study is developed around the 18 individual townships, plus The City of South Haven and Casco Township in Allegan County. Each individual township has a dedicated section below detailing the information necessary for planning the next steps to get Broadband coverage throughout their respective areas. However, this study was commissioned by the Van Buren Board of Commissioners, it is also assembled with the idea that much of the planning could be done on a county wide scale, providing some economies that may not be realistic at the township level. The information supplied here is all the same, but how we move forward with it, and assemble it into a plan is yet to be determined.

The Townships are presented individually below but grouped by the seven Commission Districts. To encapsulate the remaining 72 pages into a single table, this summarizes all the data below. To also help put this into perspective, the map on the next page shows how much work is left to do. The transparent areas of the map that show the yellow background are served. All the highlighted areas indicate unserved parcels today (excepting obviously what has been built this summer). That represents over 24% of the occupied parcels in the county. The bolder yellow, light blue and dark blue hatch areas are all funded through RDOF or Reconnect, and have just started to get built, but mostly unserved today. The orange hatched areas are everything that is left. The **Gap** Parcels. 6085 parcels (14.7% of the occupied parcels in the county) with no current plan.

Commission District	1	2	3	4	5	6	7	
Total Parcels	10070	7887	7184	6596	5395	7820	5845	50797
Undeveloped/Unoccupied/Other	1795	2279	1197	1449	896	1453	463	9532
Occupied Parcels	8275	5608	5987	5147	4499	6367	5382	41265
Unserved	1063	3559	2092	1221	229	1542	314	10020
Serviceable Parcels	7212	2049	3895	3926	4270	4825	5068	31245
Grant Funded (approximate)	288	2786	1238	436	64	696	8	5516
Gap Parcels	775	773	854	785	165	846	306	4504
Percent of Community that is serviceable	87%	37%	65%	76%	95%	76%	94%	76%
Percent of Community currently unserved	13%	63%	35%	24%	5%	24%	6%	24%
Percent of unserved to be provided by current grants	27%	78%	59%	36%	28%	45%	3%	55%
Percent remaining after RDOF/ReConnect	9%	14%	14%	15%	4%	13%	6%	11%
Budget Estimate Minimum	\$5,758,000	\$4,093,500	\$4,227,000	\$4,005,500	\$660,000	\$4,278,500	\$2,142,000	\$25,164,500
Budget Estimate Maximum	\$10,784,500	\$7,666,000	\$8,695,000	\$7,663,000	\$1,567,500	\$8,375,000	\$4,284,000	\$49,035,000



Commission District 1

Commissioner Gail Patterson-Gladney

City of South Haven

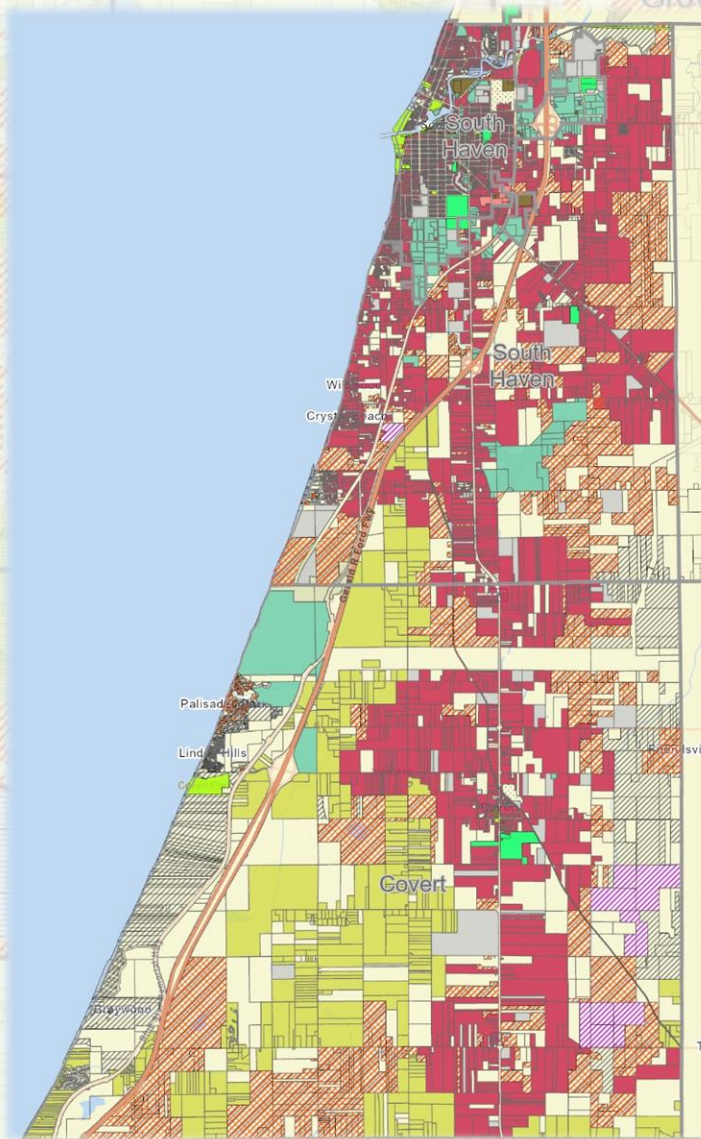
South Haven Township

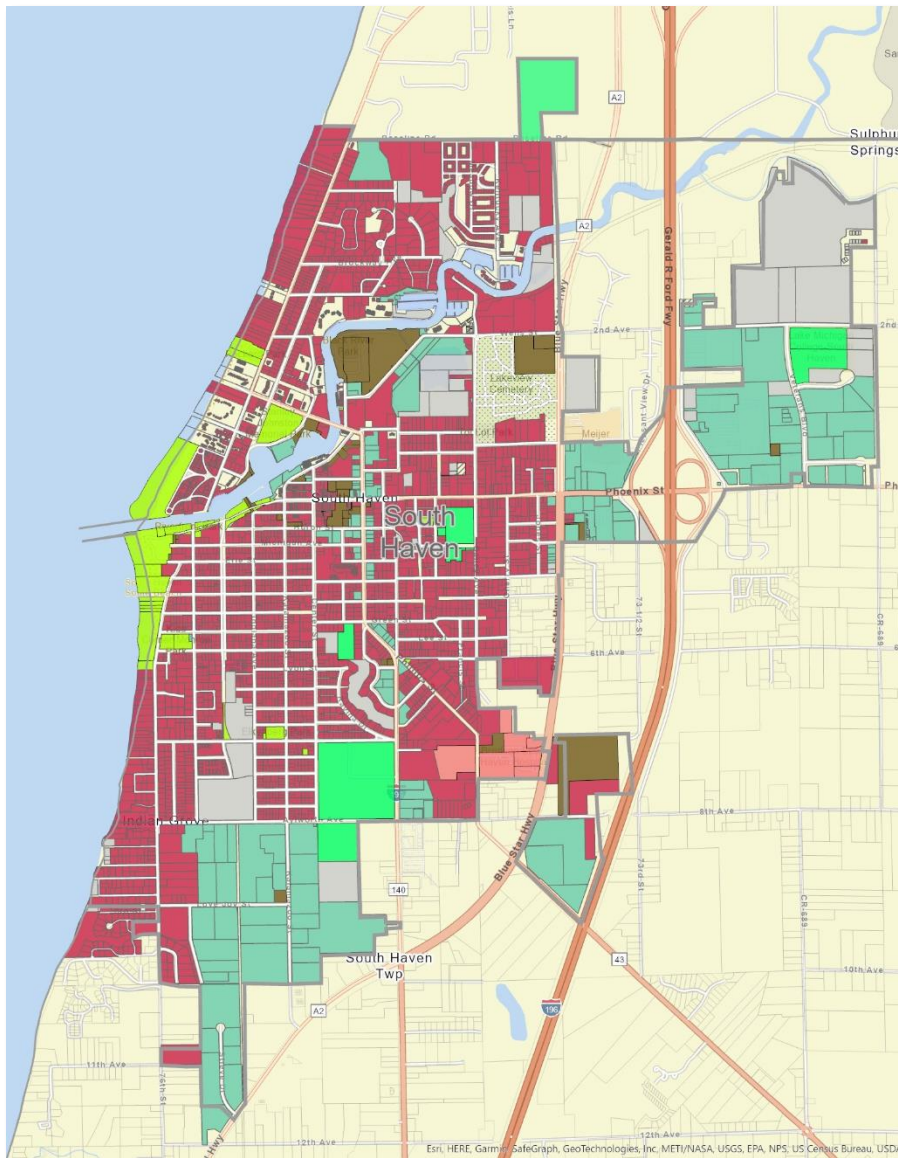
Covert Township

Casco Township (Allegan County)

Total Parcels	10070
Undeveloped/Unoccupied	1795
Occupied Parcels	8275
Unserved (including Ag)	1064
Served Parcels	7212
Grant Funded Parcels (approximate)	288
Gap Parcels	775

The Gap filling requirements for this district are a near equal mix of suburban and rural extensions of existing networks, and large rural areas. Based on current trends and ongoing efforts in the industry, the costs for reaching the remaining 775 parcels are estimated between \$5.76M to \$10.78M





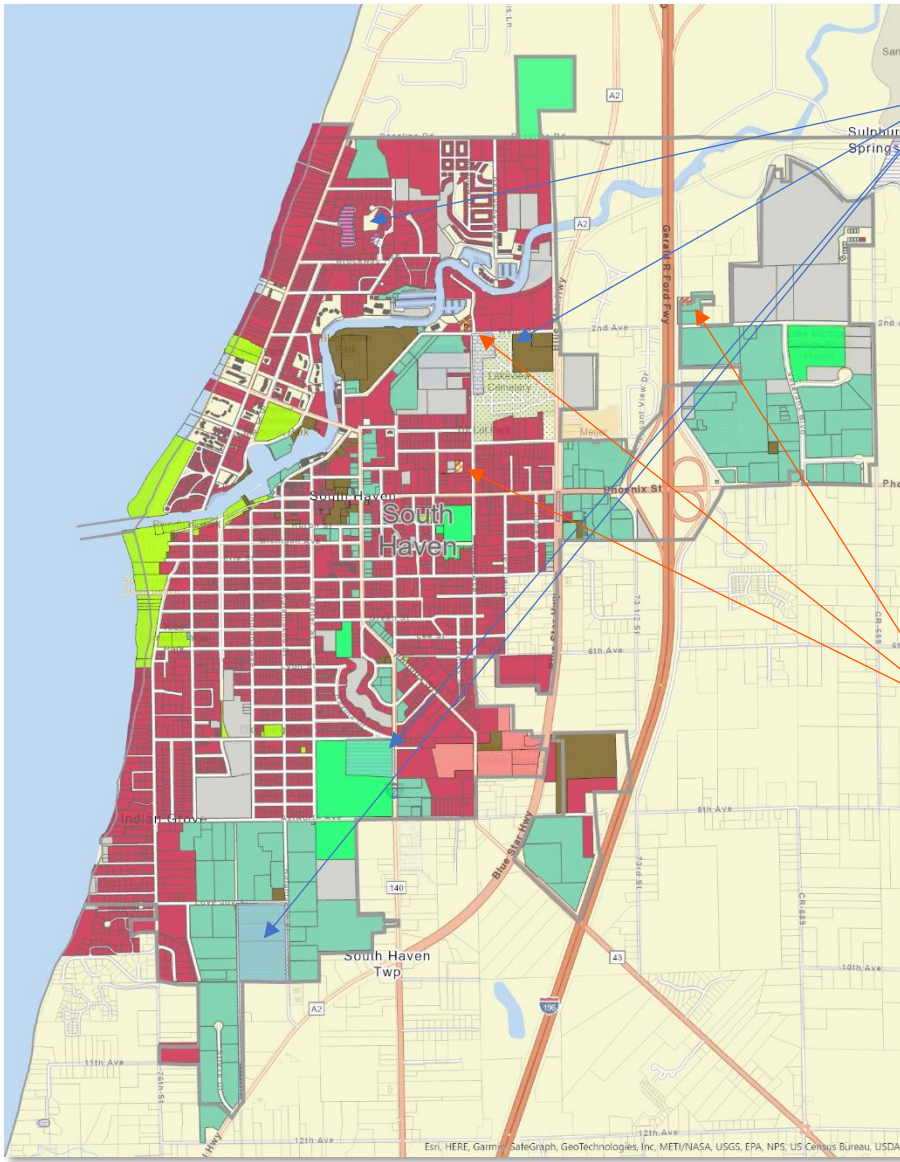
City of South Haven

Total Parcels	4611
Undeveloped/Unoccupied	136
Occupied Parcels	4475
Unserved (including Ag)	23
Served Parcels	4452
Grant Funded Parcels (approximate)	??
Gap Parcels	23

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	

City of South Haven is serviced almost exclusively by Comcast (red). There are a couple other options for commercial or industrial customers through AT&T, ACD.Net, Bloomingdale Communications, and a few others, but Residential customers only have the option for Comcast. There are a few isolated situations where Comcast is not available.

There is however a commitment by Mercury Wireless through the RDOF program that may facilitate some options in the future.

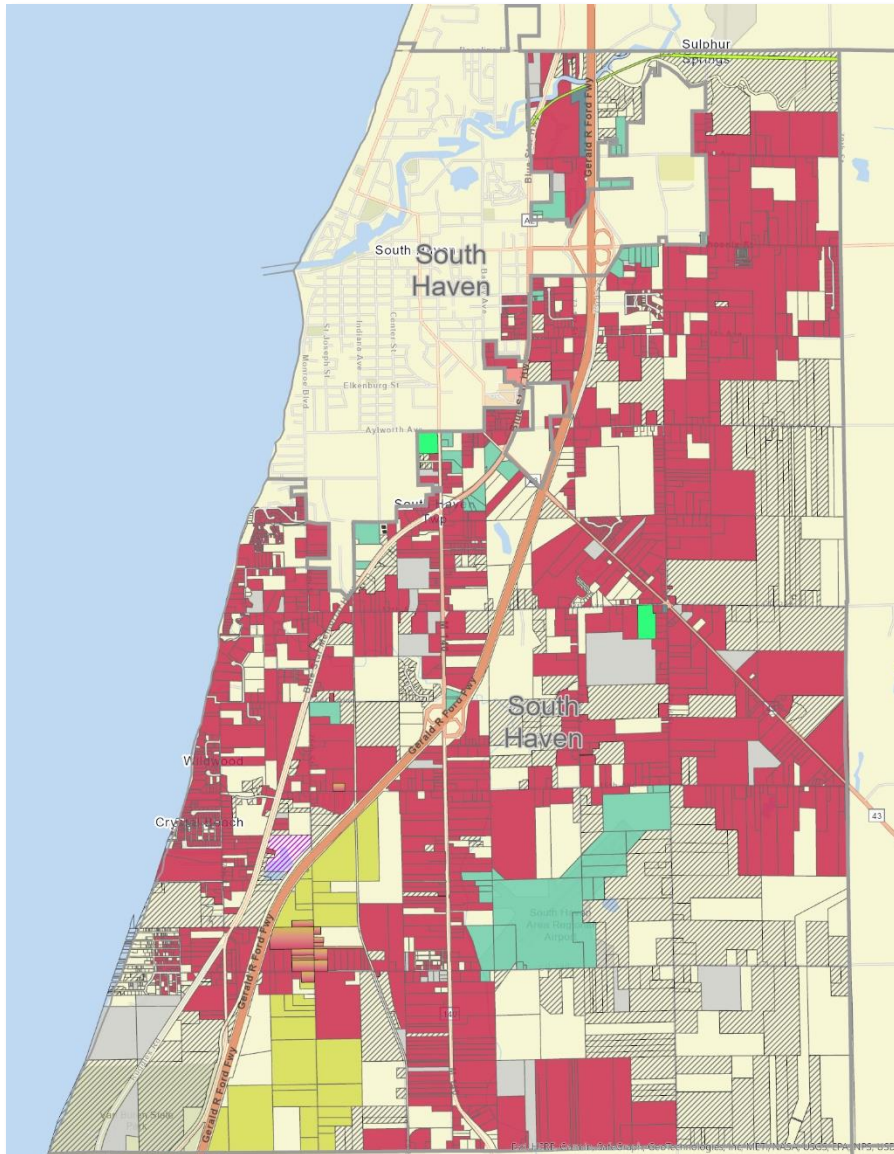


Current Grant Programs

The City of South Haven has a few small RDOF areas granted to Mercury Wireless, which are areas either currently serviced by Comcast, or non-residential areas (Industrial Park, Cemetery, Public Parks, etc.). This is a known issue with the FCC Form 477 and RDOF program, but it is not clear how ISPs that have ambiguous awards like this are supposed to respond. Unless the FCC specifically excludes these areas, the ISPs are receiving funding based on those areas, and have some level of obligation based on that. There have been forfeitures by some ISPs in other areas, but no reports of any in Van Buren County RDOF awards. A few of the Mercury RDOF awarded parcels are residential in the Ashley Lane area off North Shore Drive, which provides a catalyst for further discussions with Mercury about their obligations and intentions.

Gap Planning

RDOF doesn't provide any new served customers, but there are 23 addresses/parcels within the City of South Haven isolated around the city that are currently unserved. Specific locations are available in the GIS database provided separately, and include a mobile home community and a couple of individual residences. The total costs to reach these last 23 addresses should be between \$149K to \$253k.

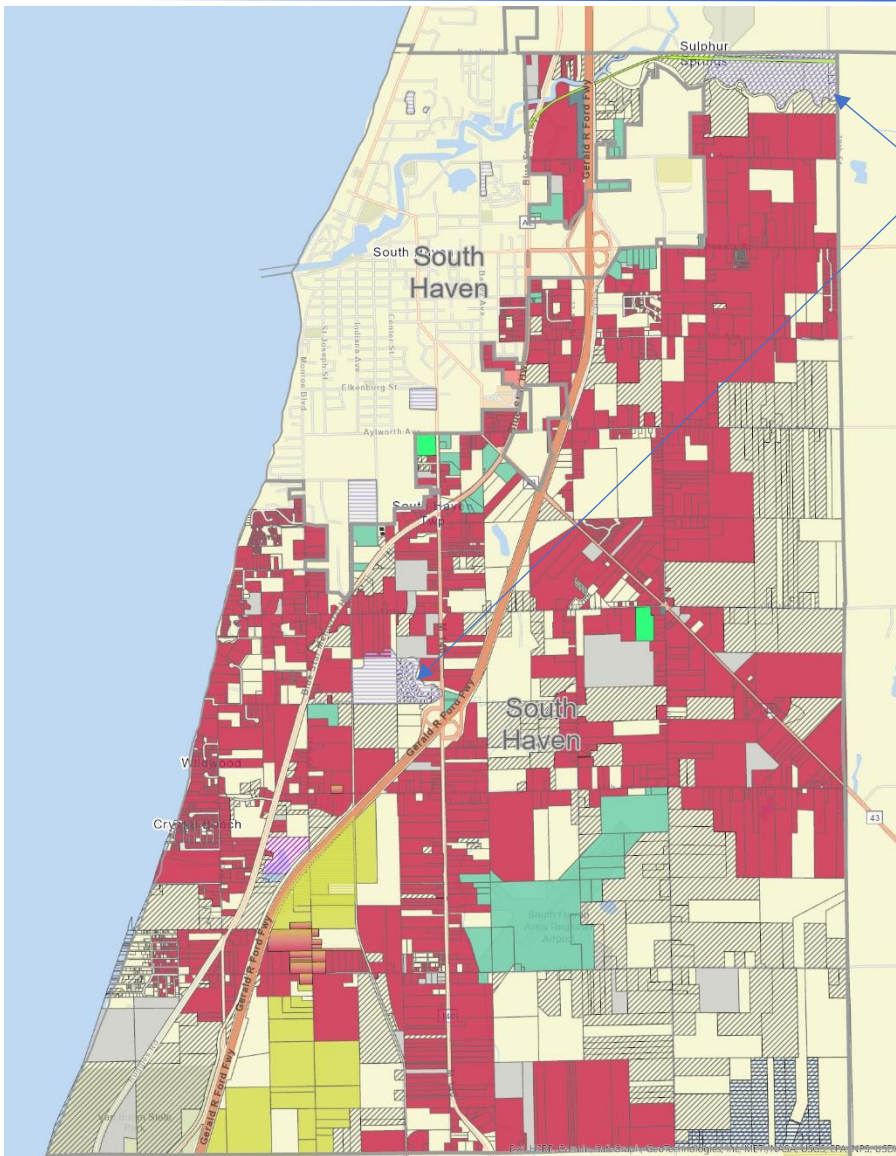


South Haven Township

Total Parcels	2729
Undeveloped/Unoccupied	695
Occupied Parcels	2034
Unserved (including Ag)	366
Served Parcels	1668
Grant Funded Parcels (approximate)	21
Gap parcels	345

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	

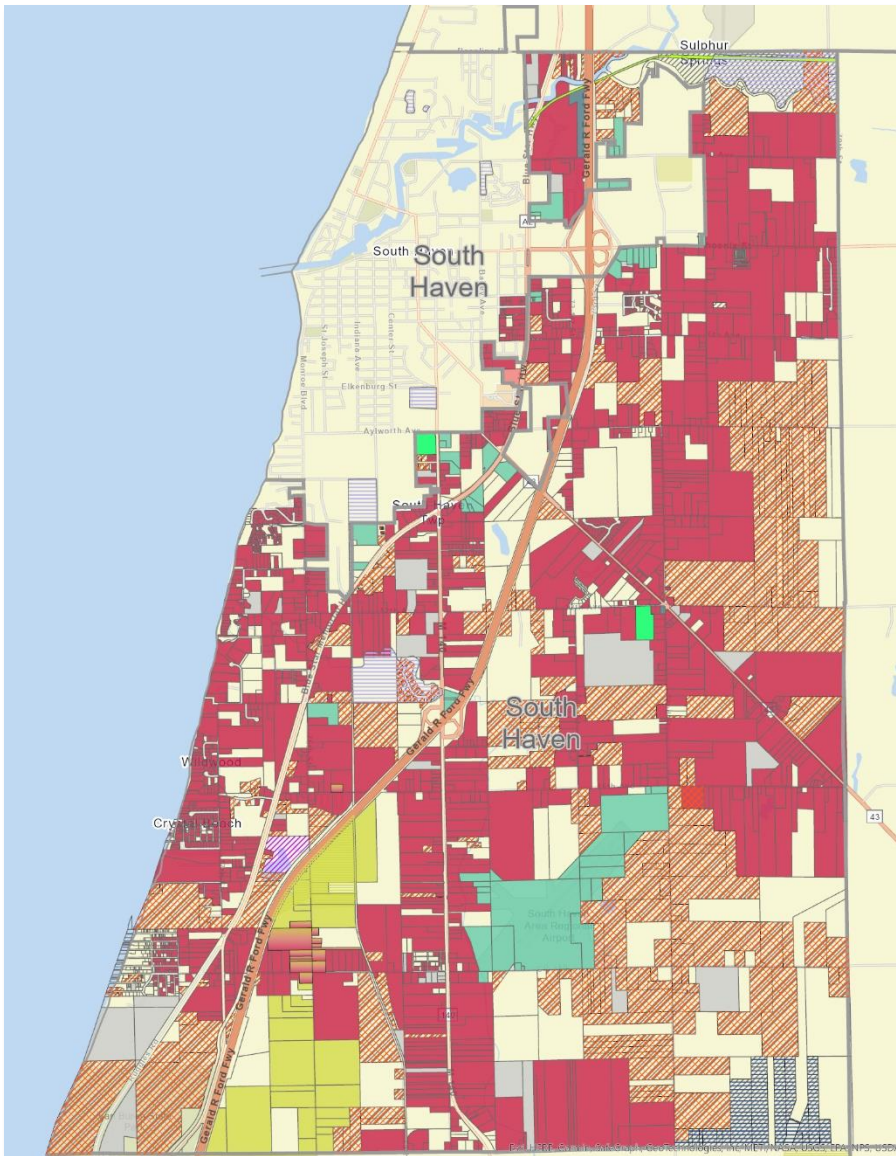
South Haven Township is largely serviced by Comcast (red), with a smaller footprint served by MEC (yellow). There is some overlap between the two ISPs in the CR-380/76th St area, offering some residents a choice. However, 18% of the township has no access to high-speed cabled Broadband today, and the current grant programs address less than 1% of the total community.



Current Grant Programs

South Haven Township has very little in the form of current Broadband Grants. The Township has a couple of small areas from RDOF granted to Mercury Wireless. It is not clear what technology they have proposed, but the areas are somewhat isolated (note the light blue hatched areas on the map to the left).

Bloomington Communications is currently building out an area under the USDA ReConnect program. Mostly in Geneva Township, it extends into the SE corner of South Haven Township along 24th Avenue, providing fiber-based access to Gigabit Internet services, as well as other Bloomington Communication services.

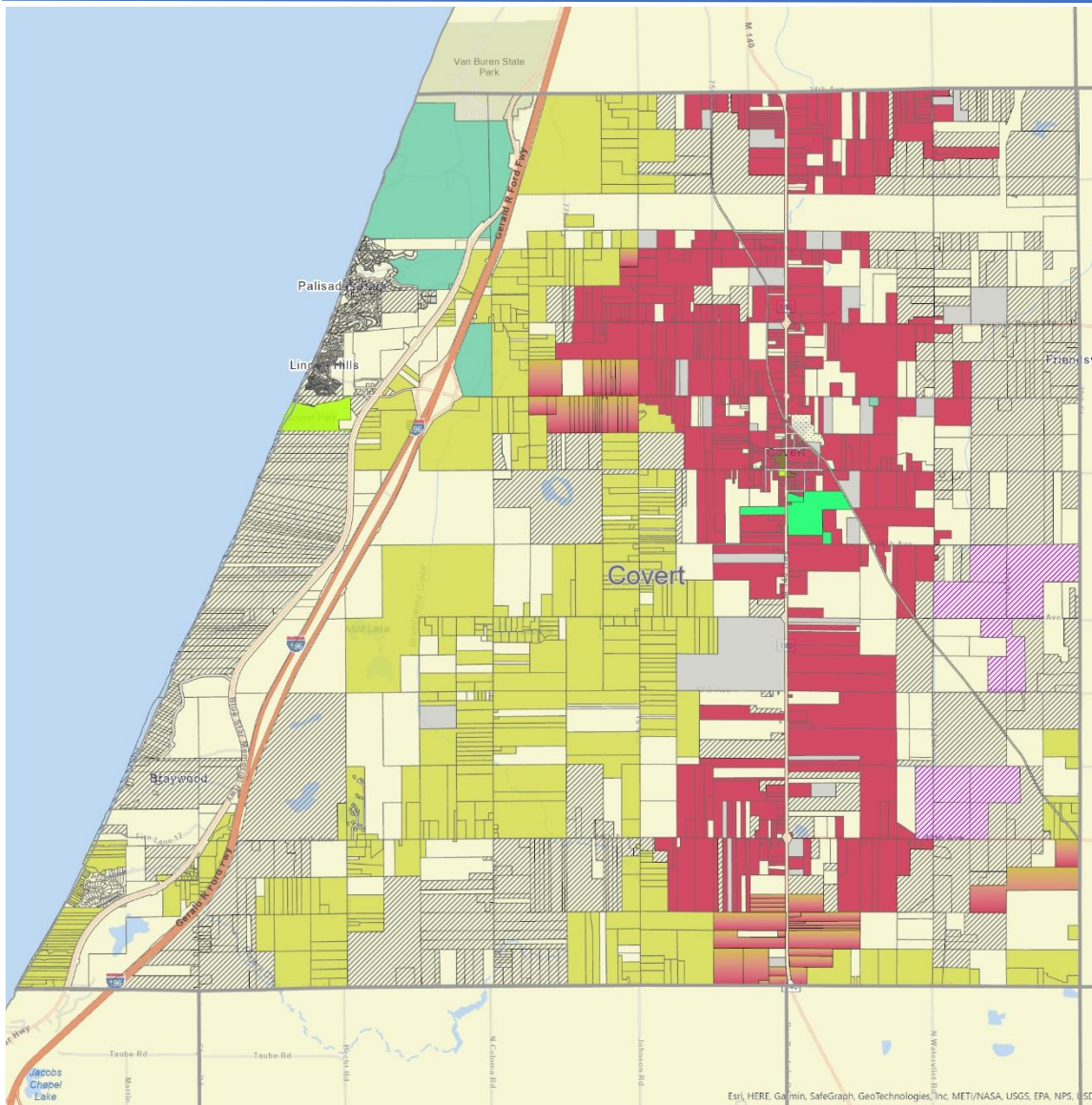


Gap Planning

Aside from the small RDOF plans, and the BCI activities, there are still 345 addresses/parcels in the township that will not have access to reliable Broadband. There are many gaps existing in the Comcast service area, which are simply homes on large parcels and too far from the main Comcast distribution system to be able to connect technically, or economically. Some of these may require additional design considerations for the network, others may already have accommodations for a short extension that is just not built yet. In all cases, the first recommendation would be to explore alternatives with Comcast to extend their services.

Midwest Energy & Communications (MEC) has begun construction of Fiber services in the southern part of South Haven Township and into Covert Township (next section), and should be consulted as well regarding many of the larger areas in the southern and eastern portions of the township. MEC and Comcast are both well positioned to extend their existing systems into the larger Gap areas within the township, and Bloomingdale has a small presence that could also be leveraged to provide a competitive alternative.

Based on current industry trends, the estimate to fill the remaining Gaps in South Haven Township are between \$1.38M and \$3.27M. It would also be recommended to put a "Long Drop" agreement in place with all ISPs to eliminate ambiguity for the cost of, and technical limitations for long drops. This type of agreement will be based on the type of technology (FTTH or HFC), being offered by the ISP.

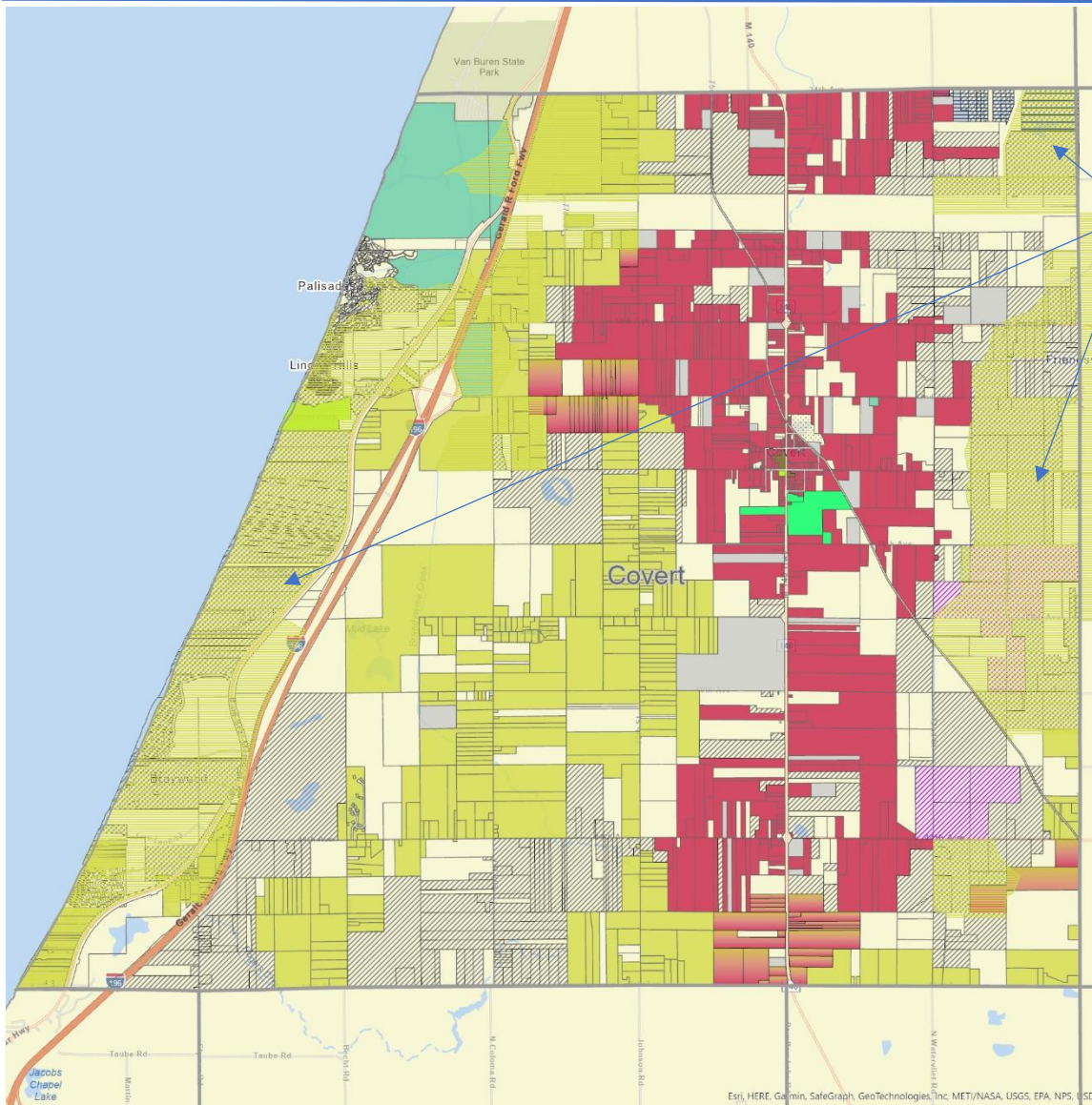


Covert Township

Total Parcels	2730
Undeveloped/Unoccupied	964
Occupied Parcels	1766
Unserved (including Ag)	674
Served Parcels	1092
Grant Funded Parcels (approx.)	267
Gap Parcels	407

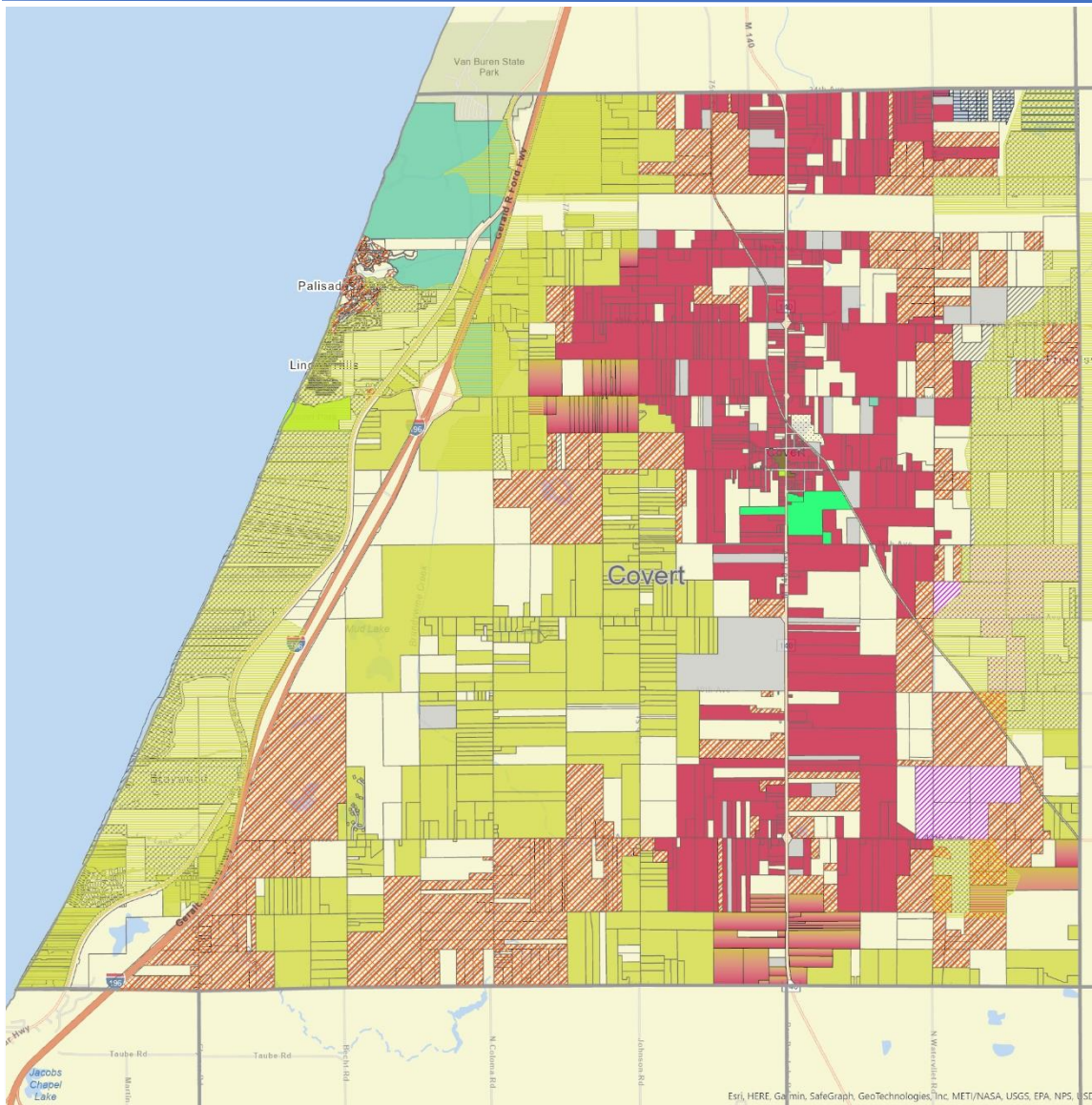
Covert Township's two existing ISPs are Comcast (red) and MEC (yellow). There is some overlap in their system offering some residents a choice (yellow/red gradient). 38% of the township is currently unserved, but there is current RDOF activity in the township which will still leave 23%, or 407 parcels unserved.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



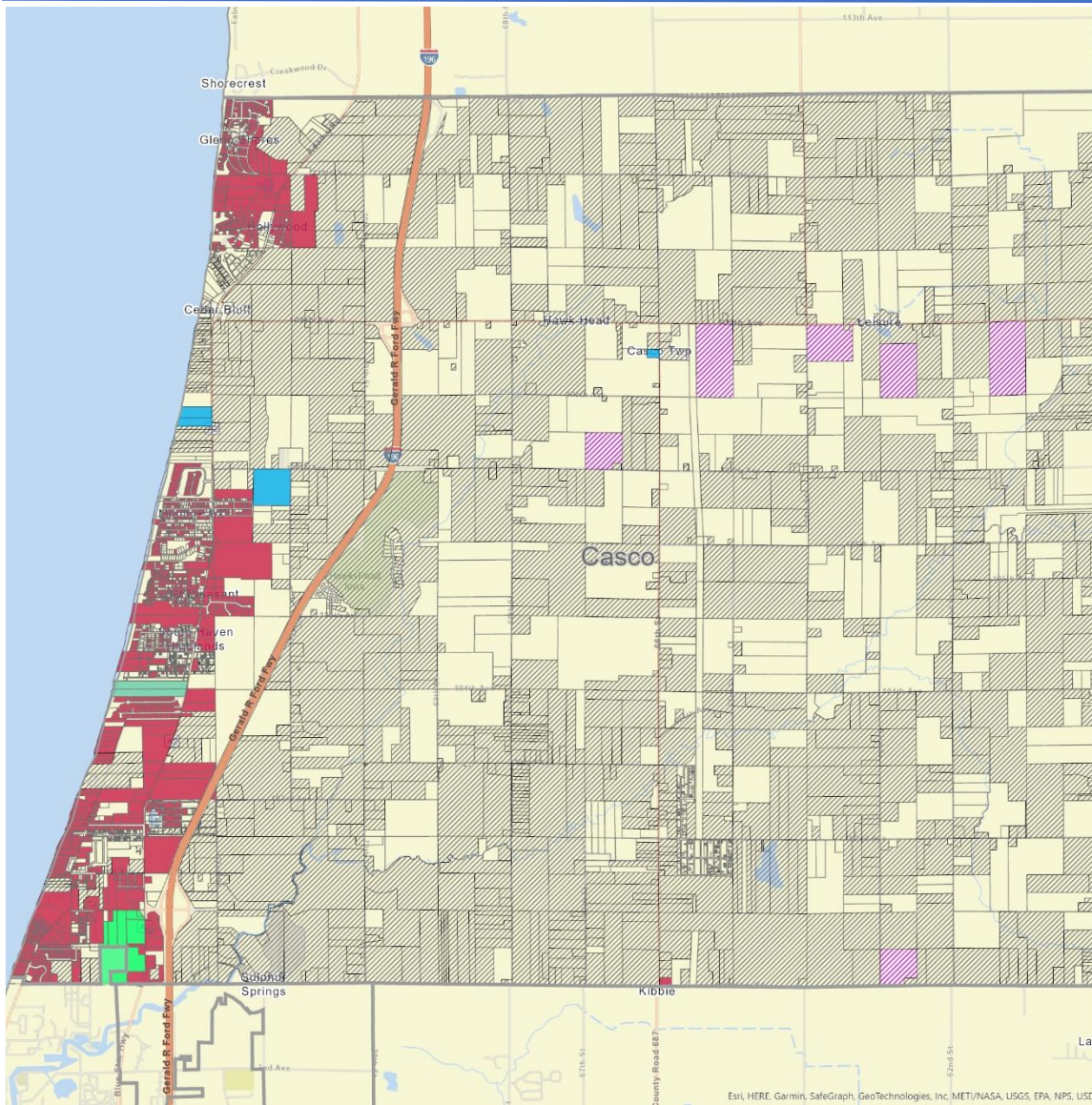
Current Grant Programs

Covert Township has approximately 267 parcels planned for Fiber based Broadband funded through the RDOF program with MEC (yellow hatched areas), and with ReConnect and Bloomingdale Communications in the NE corner of the county along 24th Avenue (dark blue hatch). There is some overlap in the two programs between BCI ReConnect and MEC RDOF right at the NE corner of the township. This will solve only 40% of the unserved problem.



Gaps still to be filled

RDOF and ReConnect programs by MEC and BCI are scheduled to be completed in the next few years, but there is still about 407 residents and small businesses with no current plan for getting service to them. Much of the areas remaining to be served are rural, with some gaps still to be filled in the higher density areas (see orange hatch). Based on current industry trends, the cost to complete Covert Township is estimated to be between \$2.23M and \$4.07M depending on several factors.

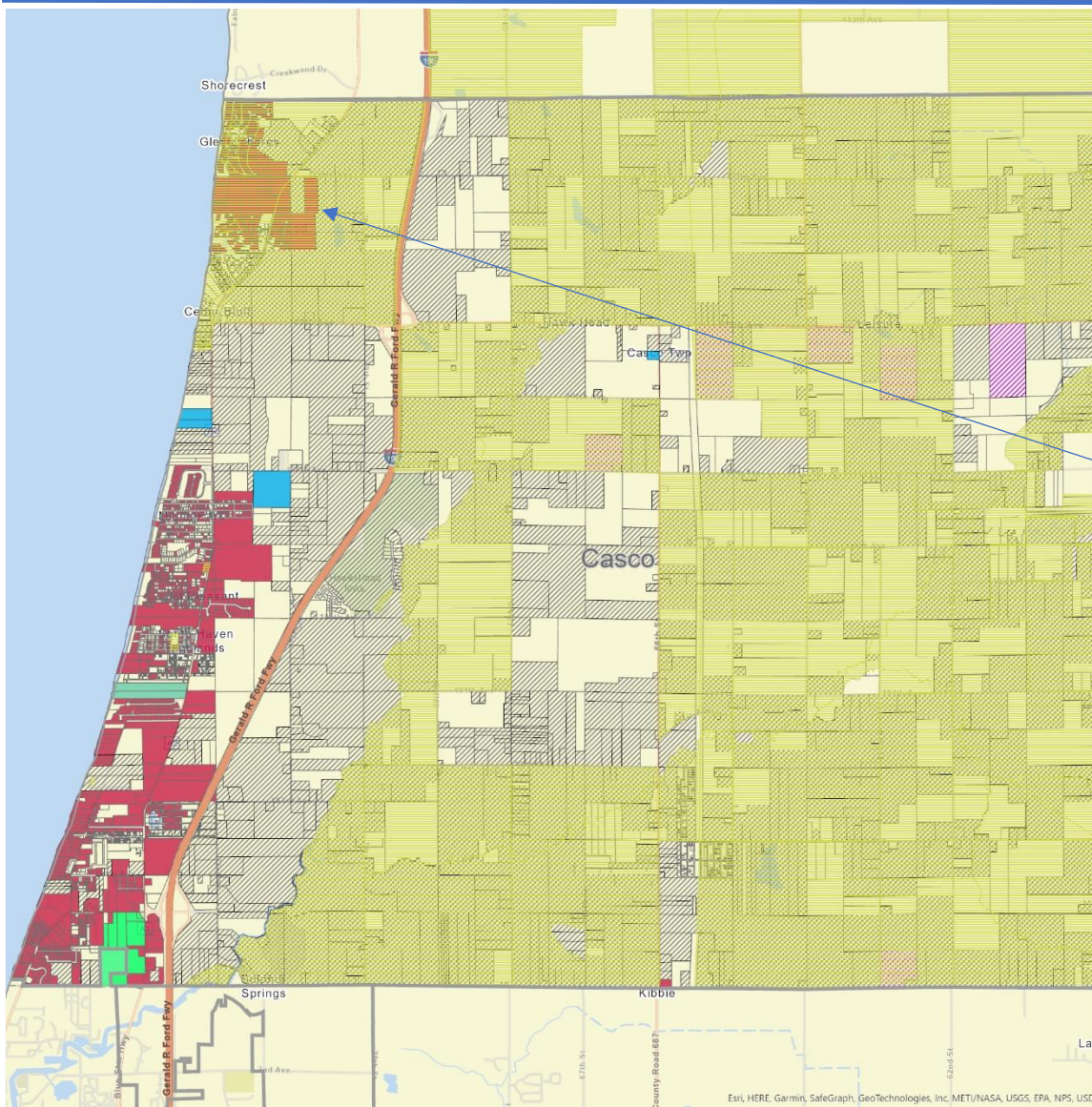


Casco Township (Allegan County)

Total Parcels	4086
Undeveloped/Unoccupied	1698
Occupied Parcels	2388
Unserved (including Ag)	1172
Served Parcels	1216
Grant Funded Parcels (approx.)	774
Gap Parcels	398

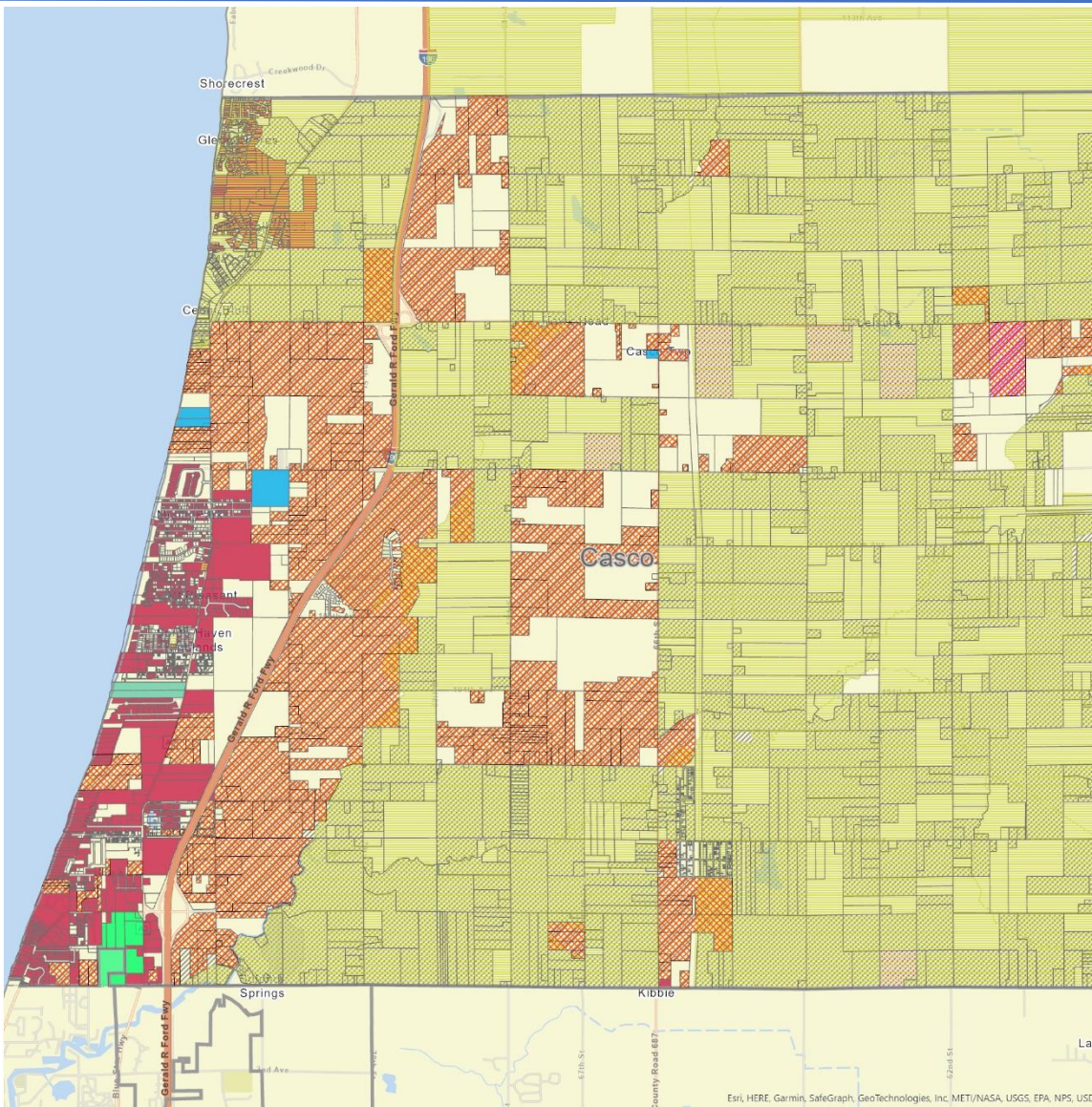
By area, Casco Township is over 90% unserved, which only represents about half of the occupied parcels, or about half of the population. 49% of the total community is unserved today.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



Current Grant Programs

Due to the majority of Casco Township being unserved, most of the township qualified for RDOF funding, which all qualified areas were awarded to MEC (as shown with the yellow hatch to the left). The RDOF area includes a densely populated area in the NW corner that Comcast recently built out; Meaning that as MEC completes their RDOF build, residents in this area will have a choice of service providers. However, even with the large RDOF coverage area, 17% of the entire community will remain unserved.



Gaps still to be filled

As shown with the orange hatch to the left, there are still nearly 400 parcels, or 17% of the entire community that are not part of the RDOF or other grant programs. Since this is part of Allegan County and included because of its relations with the City of South Haven, the cost estimates for completing the GAP filling are not included in the estimates for Commission District 1, or any totals for Van Buren County elsewhere in this report. But for planning purposes, based on current industry trends, the estimate to fill the remaining Gaps in Casco Township are estimated between \$1.9M and \$3.2M. MEC and Comcast are both well positioned to extend their existing operations within the township, however the areas may be large enough to possibly warrant an RFP process for other ISPs.



Commission District 2

Commissioner Kurt Doroh

Geneva Township

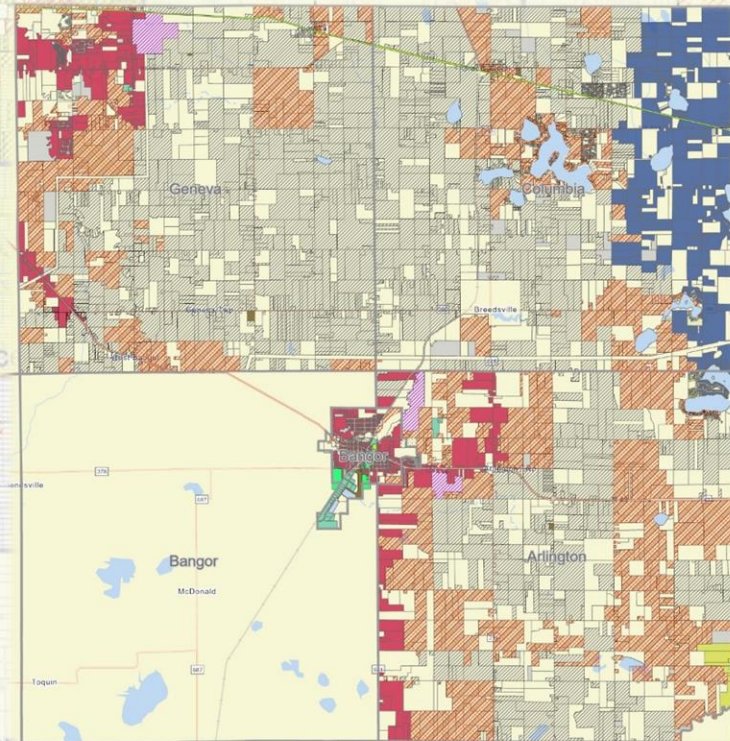
City Bangor

Columbia Township

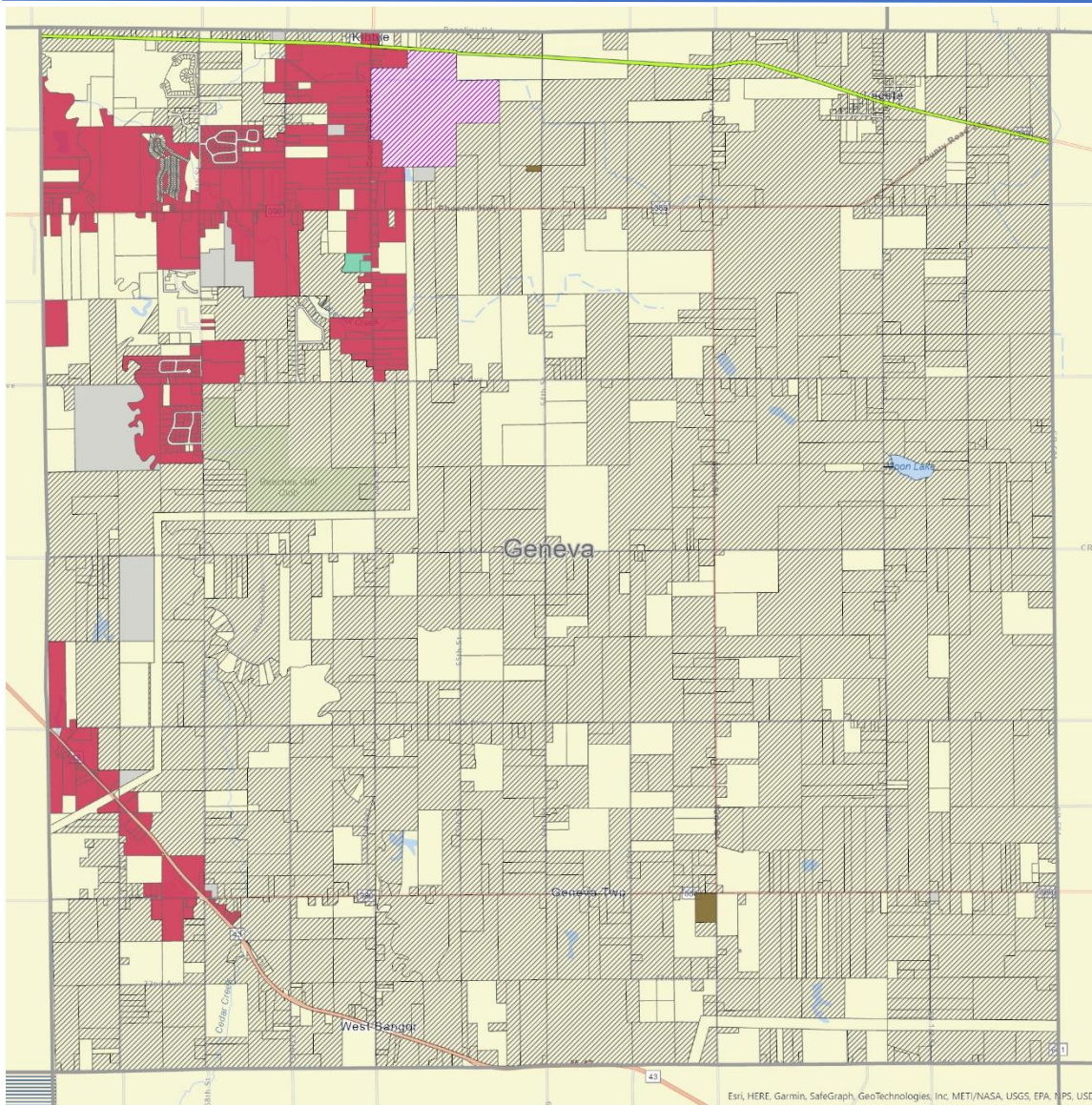
Arlington Township

Total Parcels	7887
Undeveloped/Unoccupied	2279
Occupied Parcels	5608
Unserved (including Ag)	3559
Served Parcels	2049
Grant Funded Parcels (approx.)	2786
Gap Parcels	773

Commission District 2 has the highest percentage of unserved parcels at 63%, and thus, justifiably the largest percentage of RDOF and ReConnect funding activity at 78% of the unserved parcels. However, that still leaves 14% of the community, or 773 parcels needing a plan for Broadband. The costs to build fiber systems in these areas are going to generally be higher since there are fewer parcels per road mile. The estimate for Commission District 2 is \$4.08M to \$7.6M to build fiber to all remaining Gap parcels.



DCS Technology Design, LLC

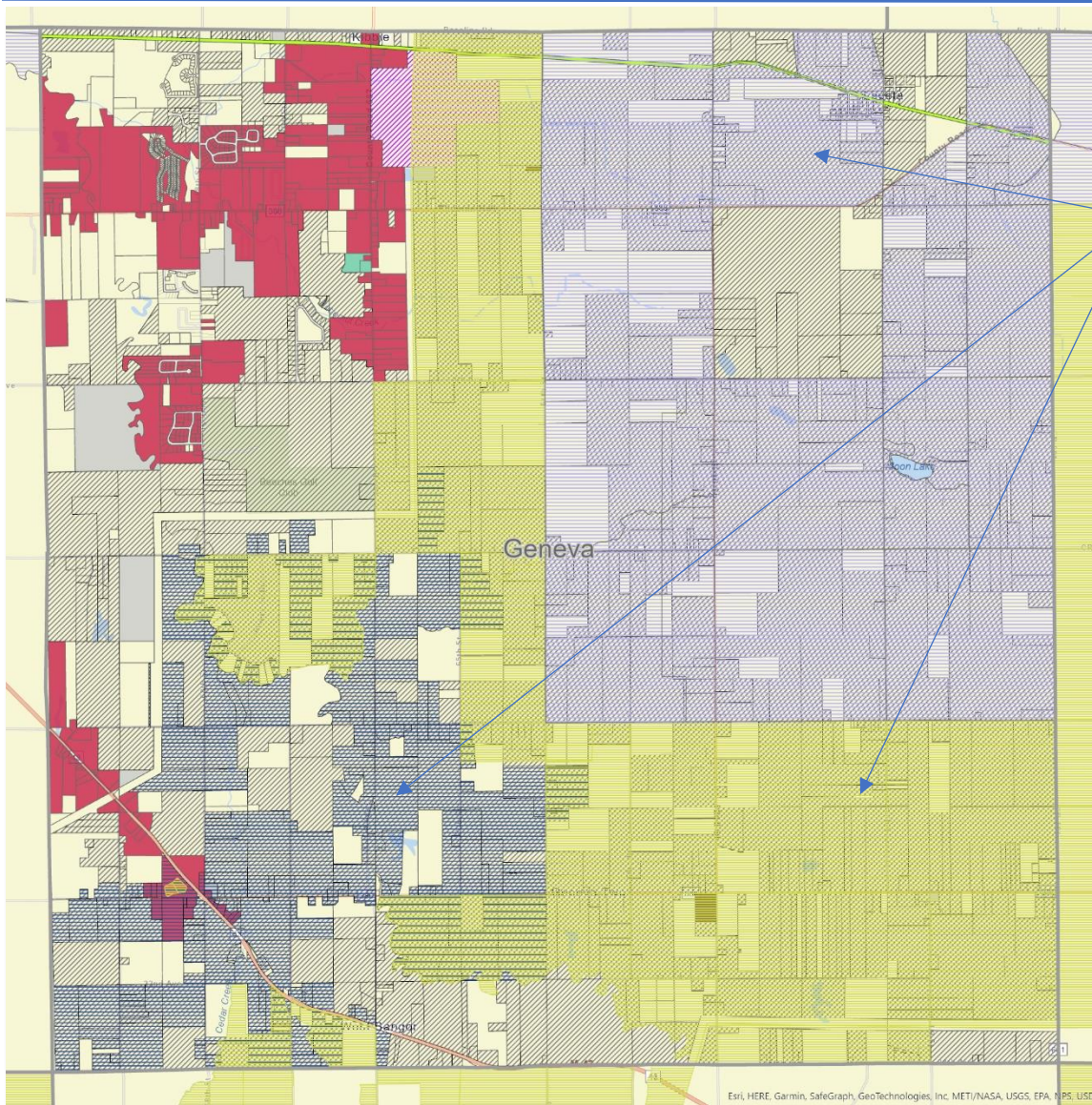


Geneva Township

Total Parcels	2202
Undeveloped/Unoccupied	568
Occupied Parcels	1634
Unserved (including Ag)	1173
Served Parcels	461
Grant Funded Parcels (approx.)	840
Gap Parcels	333

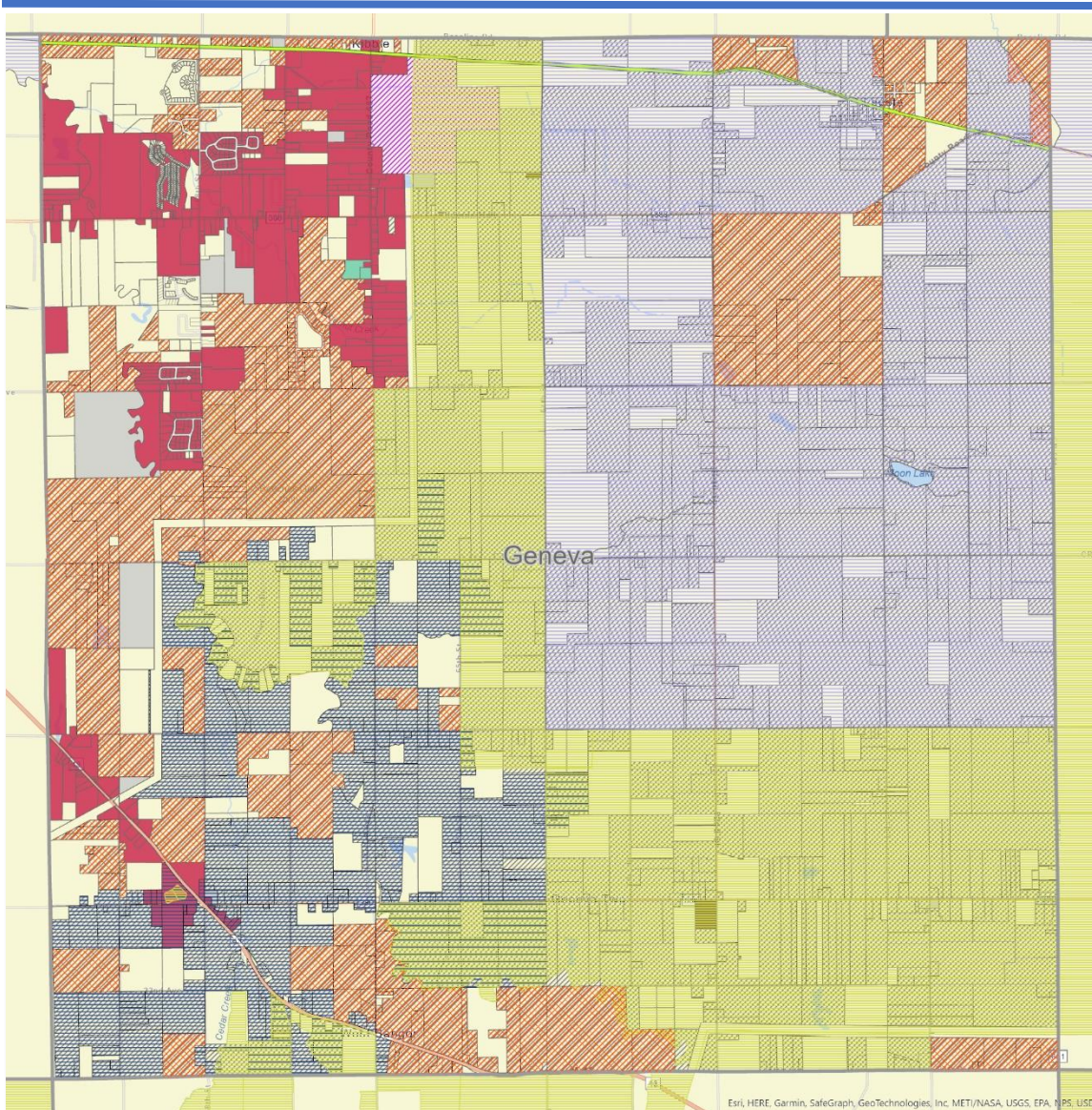
Geneva Township has the 2nd highest unserved community at 72%. Comcast is the only existing ISP offering services today, and limited to the NW sector, and along part of the M-43 corridor. But Bloomingdale Communications has activities that are planned to be available this year.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



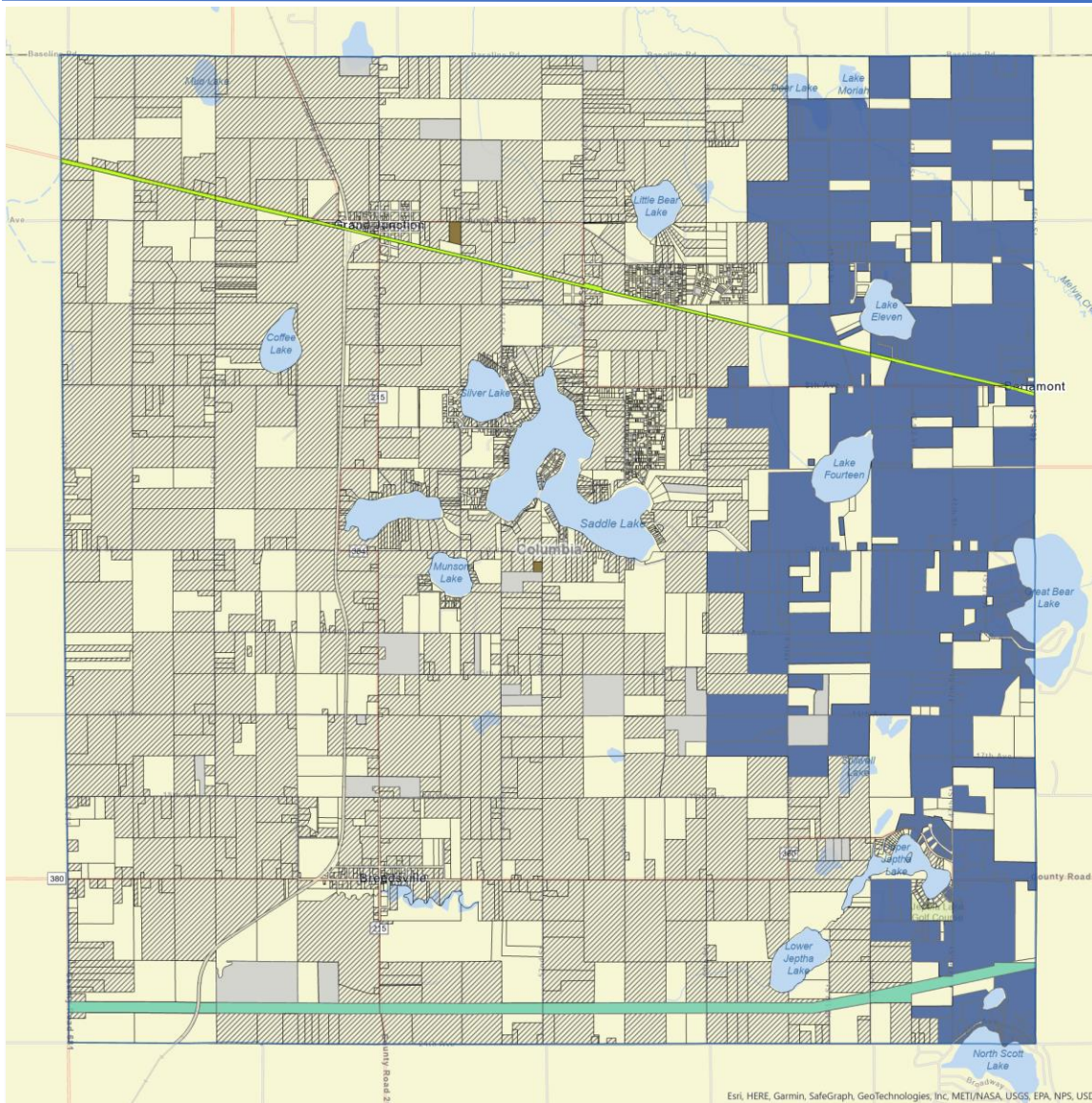
Current Grant Programs

Bloomington Communications, through the ReConnect program (dark blue hatch), is actively building new fiber networks in the SW sector of Geneva Township, expected to be completed this year. Additionally, with RDOF in conjunction with MEC (yellow hatch) and Mercury Broadband (a new provider in Michigan, shown with the light blue hatch), new service areas will be developed for the next few years. But 20% of the community is still without a plan.



Gaps still to be filled

As indicated by the orange hatch, after ReConnect and RDOF, about 20% of the community will remain without Broadband Coverage. Since there will potentially be four ISPs in this township soon, there are a few options for getting the remaining Gaps filled. Any of the four providers can easily extend their networks into the unserved areas, which encourages an RFP process once funding is secured. Or working on a partnership that could be used to pursue additional funding that will be coming available soon through the BEAD program. The estimate to fill all Gaps is between \$1.83M and \$3.33M.

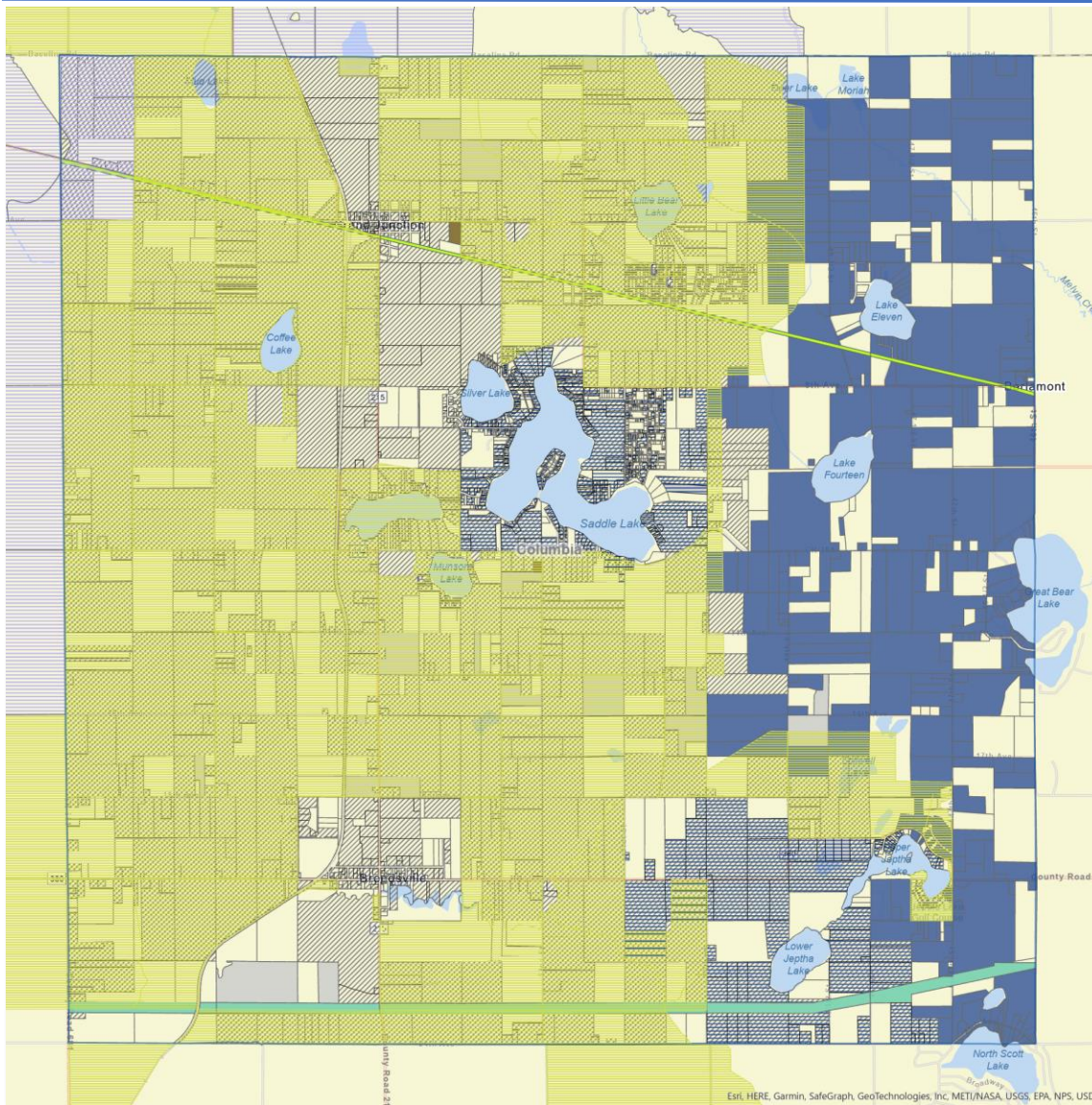


Columbia Township

Total Parcels	3060
Undeveloped/Unoccupied	1175
Occupied Parcels	1885
Unserved (including Ag)	1527
Served Parcels	358
Grant Funded Parcels (approx.)	1275
Gap Parcels	252

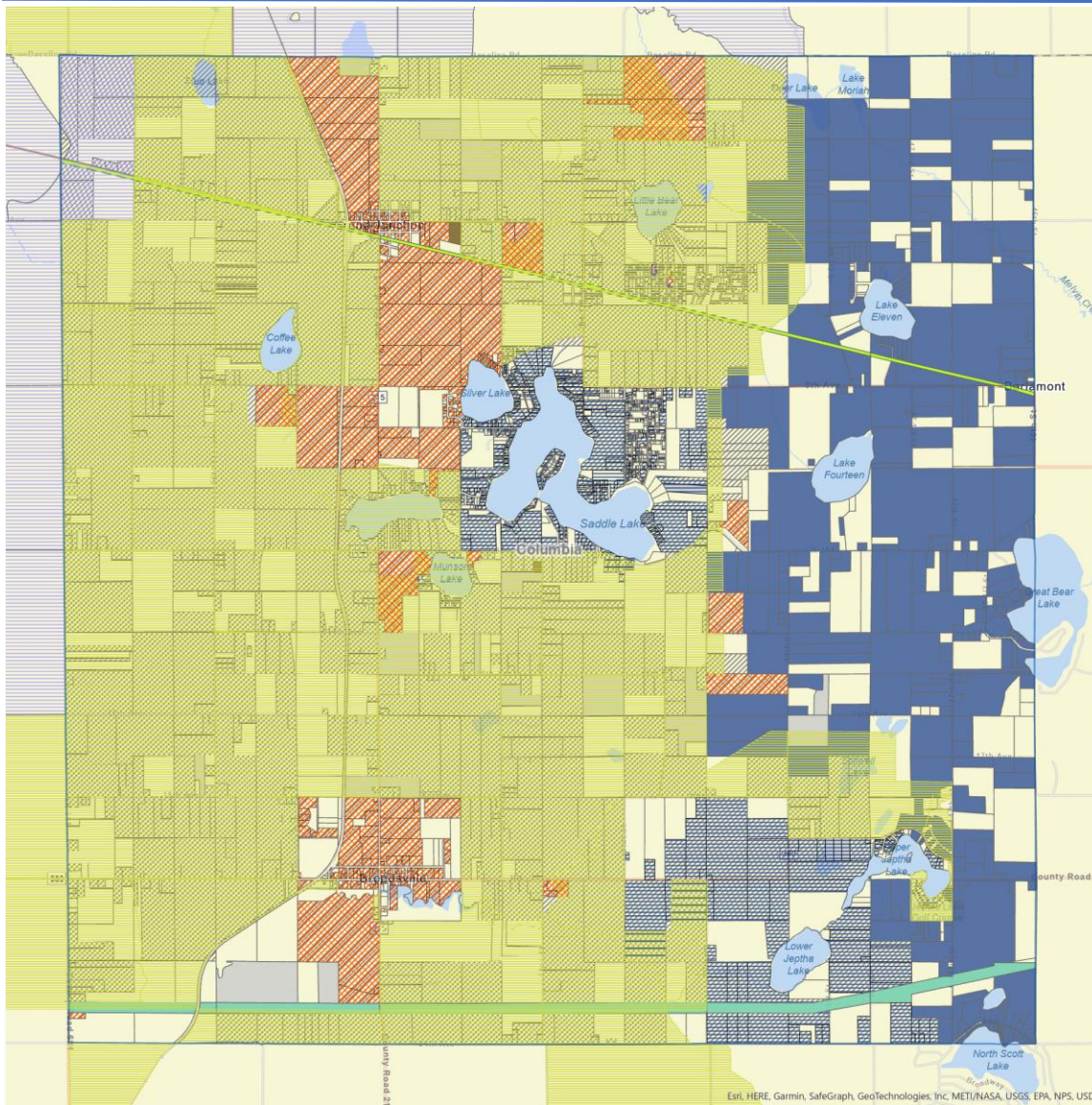
Columbia Township has the highest unserved community at 81%. Bloomingdale Communications services much of the east side of the township, but due to the unserved high density areas around the lakes, the unserved percentage of parcels is much higher than the image to the left might appear.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



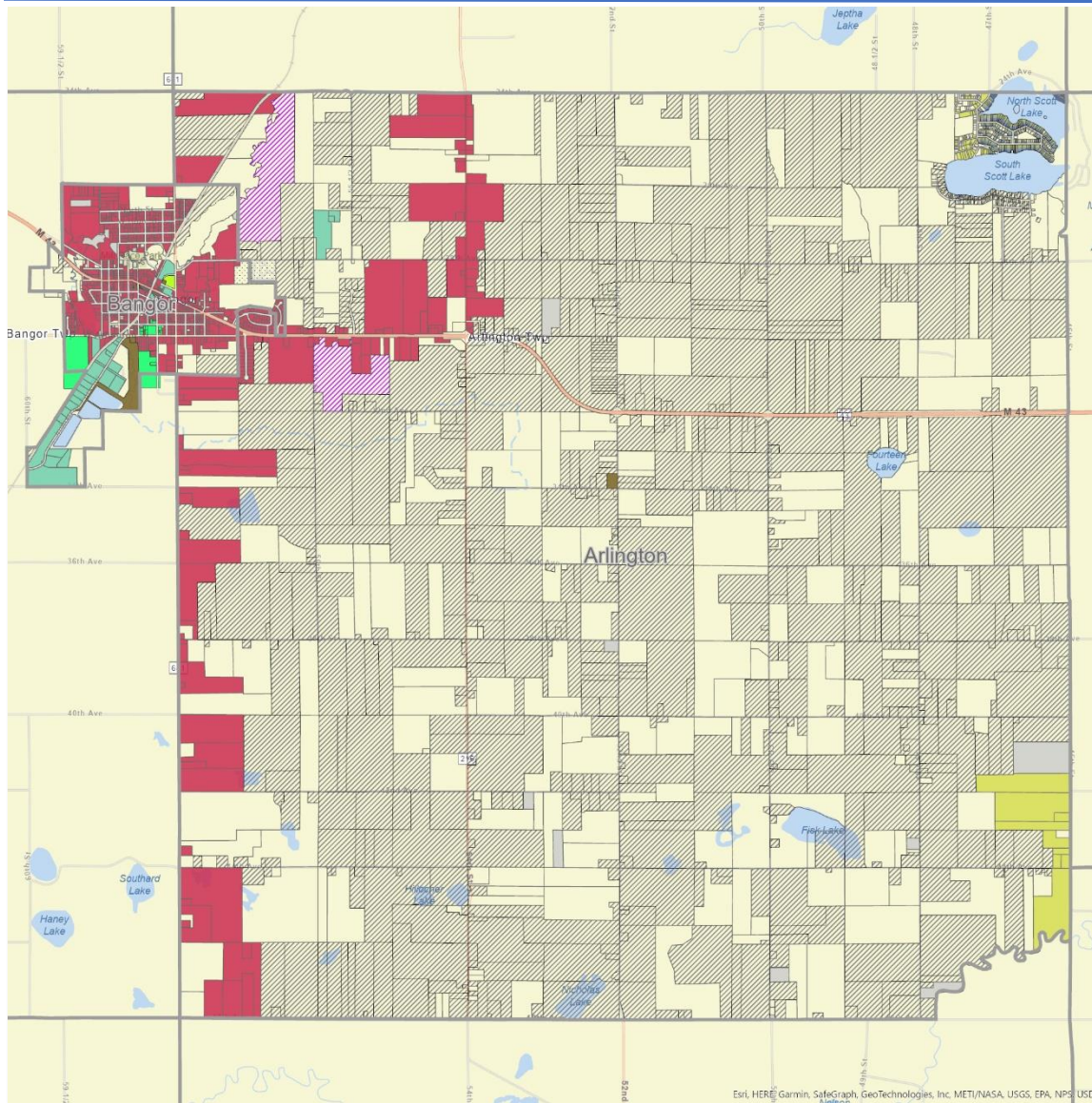
Current Grant Programs

Much of the unserved areas in Columbia Township was qualified for funding programs like RDOF, with about 775 addresses awarded to MEC, yellow hatch, and about 500 addresses to Bloomingdale Communications through the USDA ReConnect program. Depicted with the dark blue horizontal hatch.



Gaps still to be filled

After RDOF and ReConnect, there is still 13% of the occupied parcels within Columbia Township will be unserved. The estimated range to complete Columbia Townships remaining 252 parcels is between \$1.13M and \$2.27M.

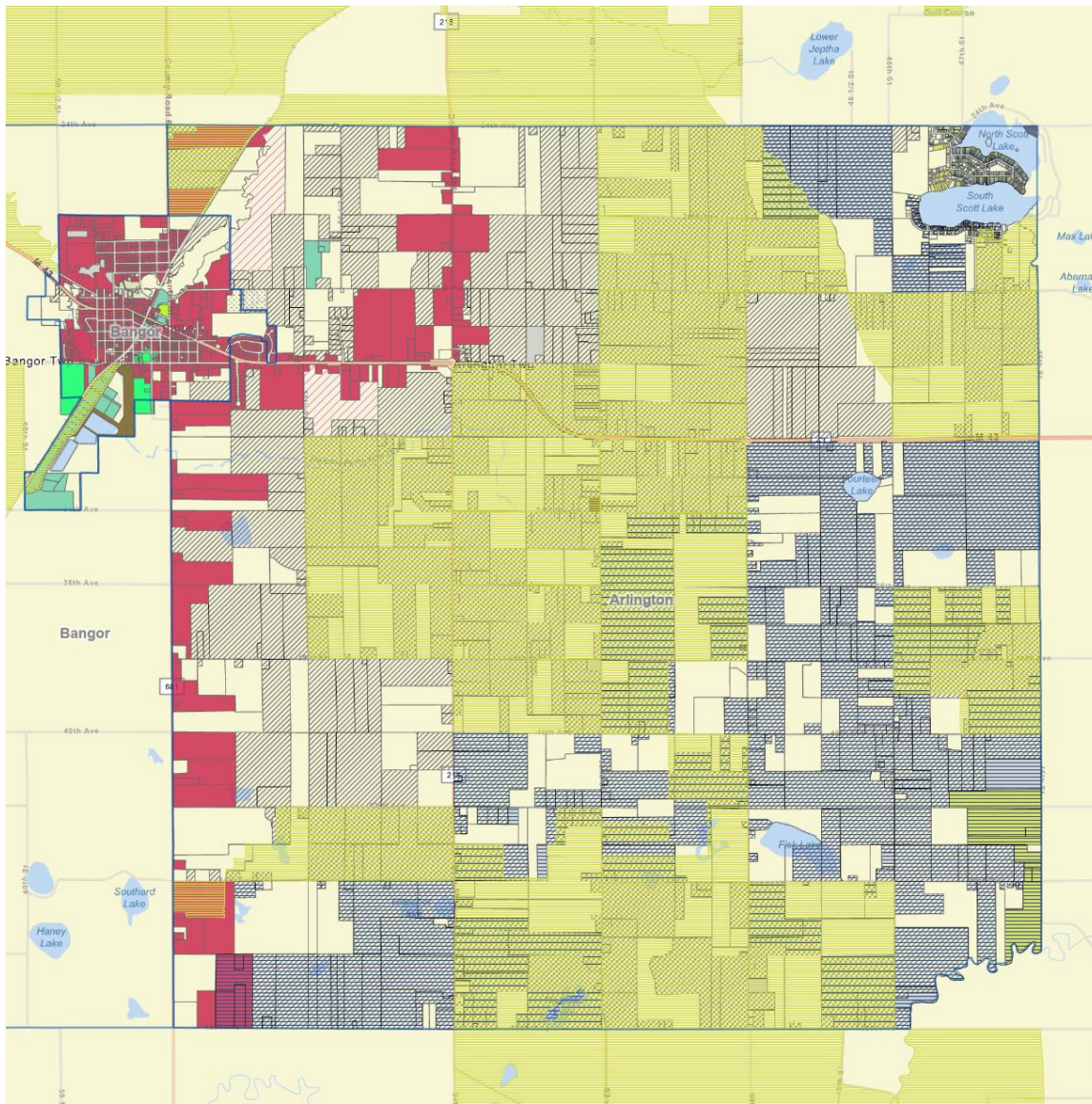


Arlington Township

Total Parcels	2625
Undeveloped/Unoccupied	536
Occupied Parcels	2089
Unserved (including Ag)	859
Served Parcels	1230
Grant Funded Parcels (approx.)	671
Gap Parcels	188

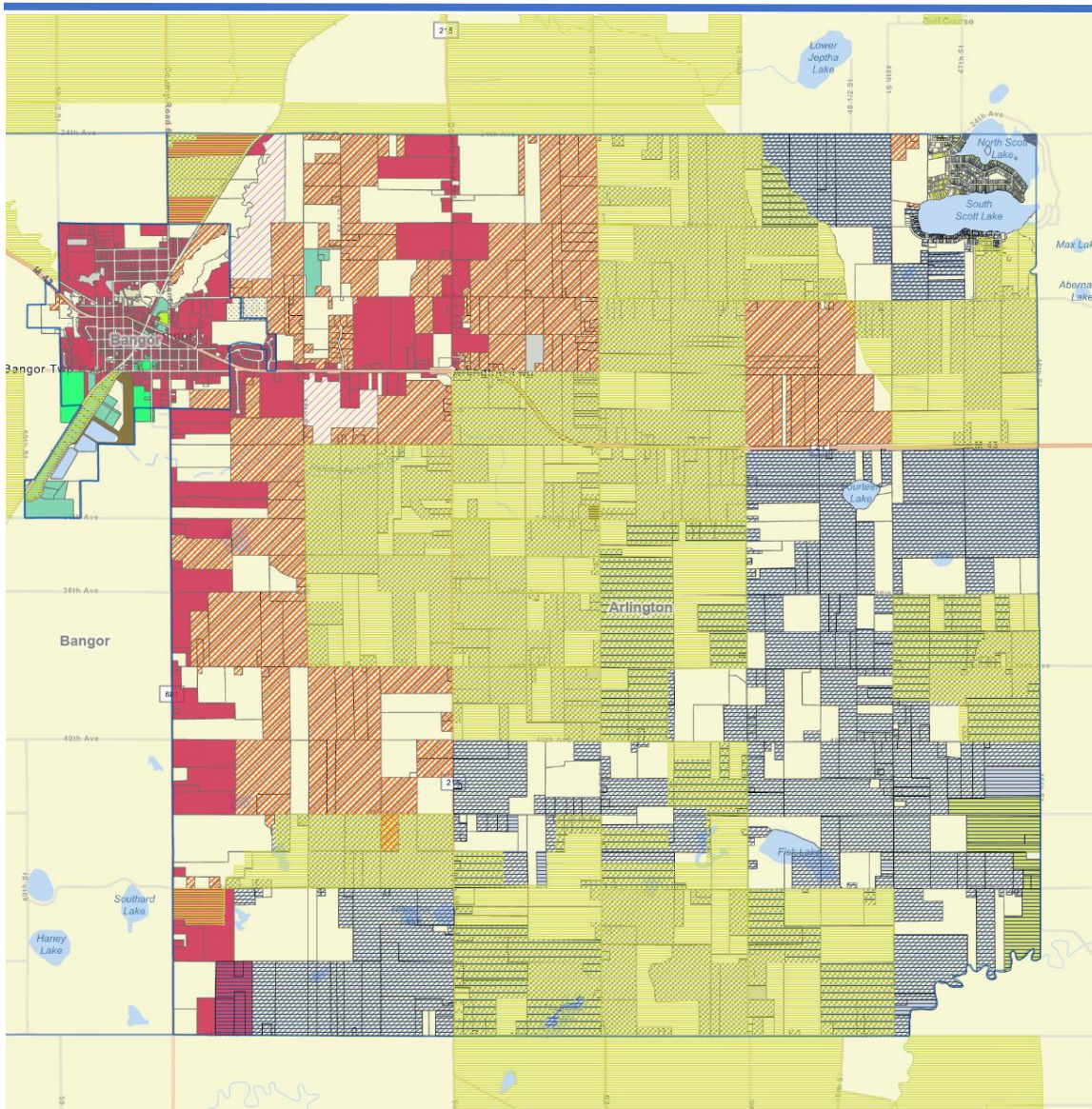
For the purposes of this report, Arlington Township includes the City of Bangor. Combined, 41% of the area is unserved, which includes only a few parcels within the City Limits of Bangor. The gray hatched areas to the left show that, geographically, most of Arlington Township is unserved, with the exception of Comcast (red) along the west side and within the City of Bangor, and MEC and Bloomingdale on the east side, with both companies serving around the North and South Scott Lakes area.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI Reconnect	



Current Grant Programs

The good news is that between RDOF and ReConnect, approximately 78% of the currently unserved areas are scheduled to be serviced by MEC and Bloomingdale Communications (respectively). However, there are still about 188 parcels with no plans for service, and you will also note that this township shows a clear example of the problems with the still current mapping systems used by the federal agencies. All of the yellow area with dark blue horizontal hatching indicates an overlap between RDOF and ReConnect.



Gaps still to be filled

The Gaps left by RDOF are mostly contiguous, suggesting that an RFP process to fill the gaps could attract other ISPs. However, the three incumbent ISPs, Comcast, MEC and Bloomingdale Communications are all well positioned to offer services in Arlington as well, without concerns about backhaul or middle mile providers. The estimated cost is slightly higher due to the larger low-density areas with fewer homes per cable mile. The estimate is between \$1.13M and \$2.38M.



Commission District 3

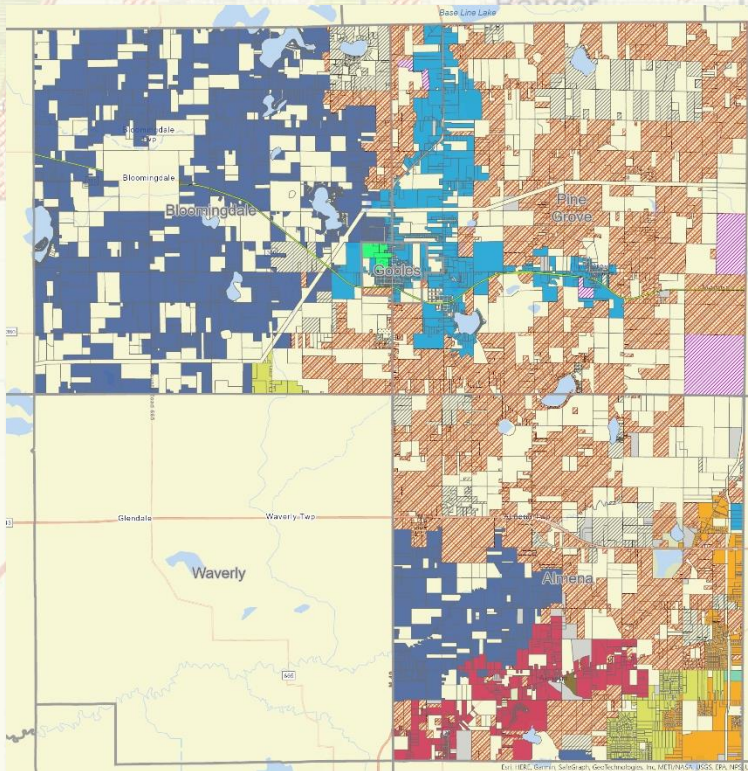
Commissioner Richard Godfrey

Bloomington Township

City of Gobles

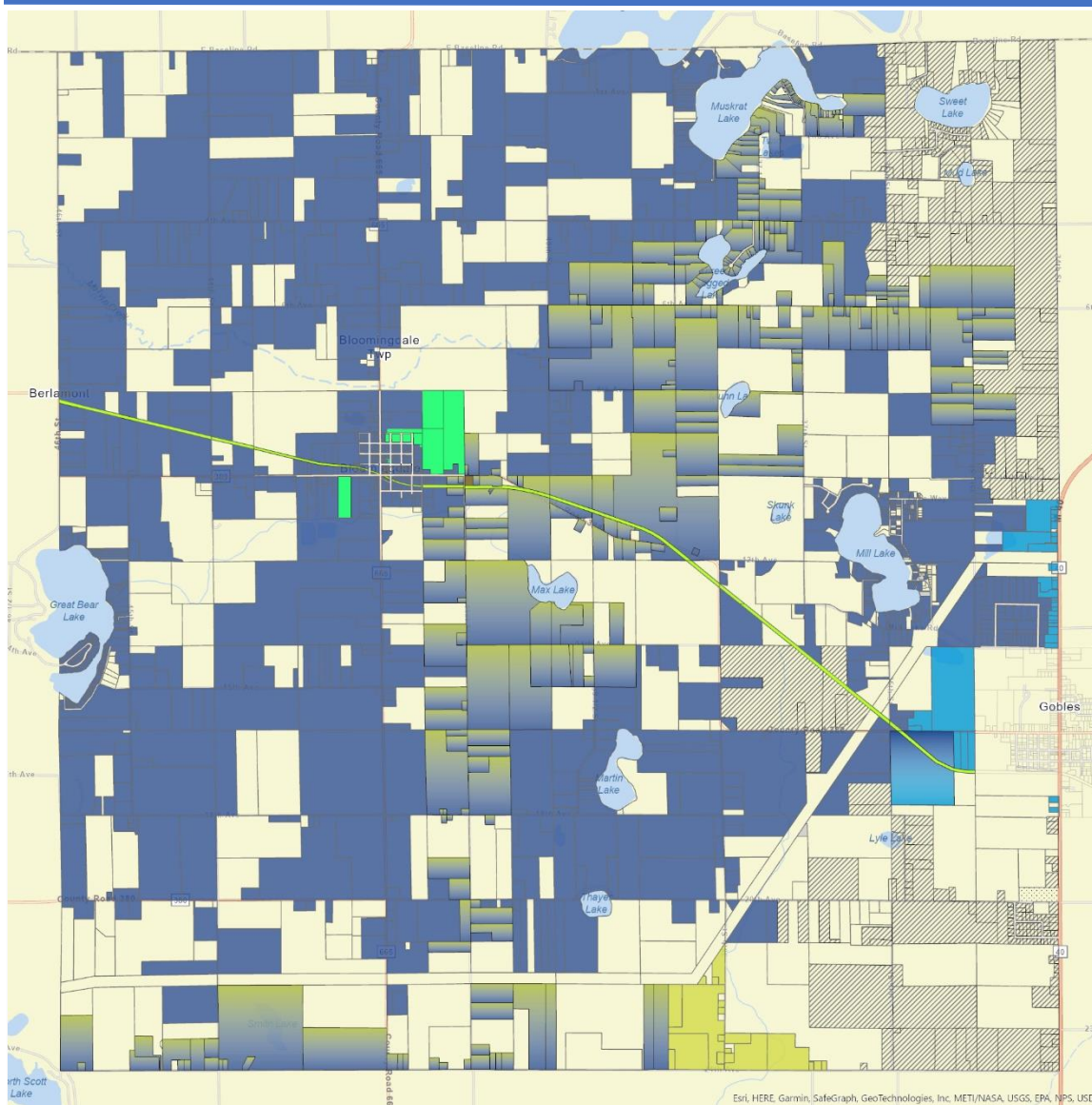
Pine Grove Township

Almena Township



Total Parcels	7184
Undeveloped/Unoccupied	1197
Occupied Parcels	5987
Unserved (including Ag)	2092
Served Parcels	3895
Grant Funded Parcels (approx.)	1238
Gap Parcels	854

Commission District 3 has the second highest unserved parcel ratio at 65% of all occupied parcels, and actually the highest number of Gap parcels with 854 that will need to be planned for. The estimate for Commission District 3 is \$4.23M to \$8.7M to build fiber to all remaining Gap parcels.



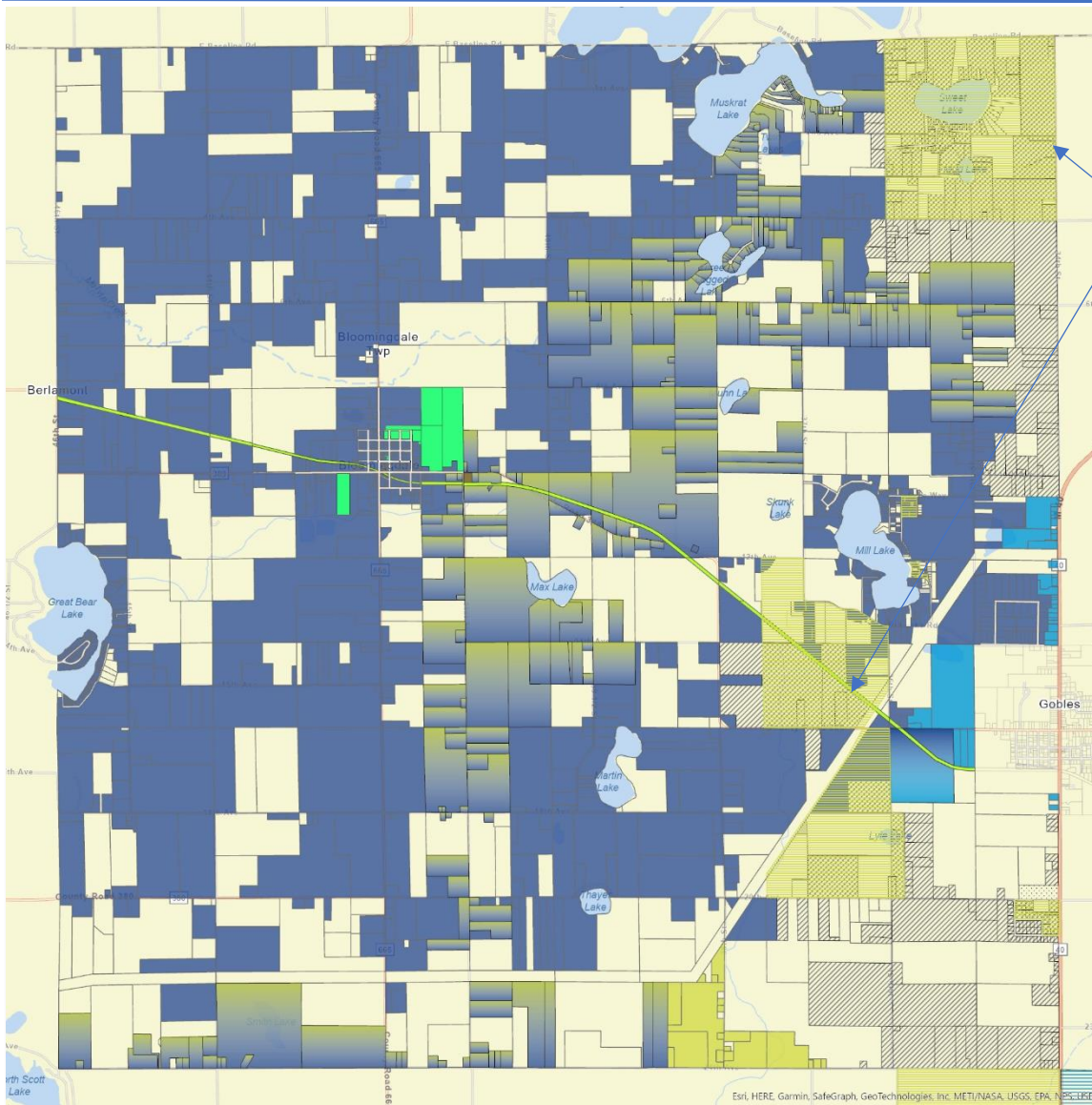
Bloomingdale Township

Total Parcels	2193
Undeveloped/Unoccupied	404
Occupied Parcels	1789
Unserved (including Ag)	292
Served Parcels	1497
Grant Funded Parcels (approx.)	137
Gap Parcels	155

84% of Bloomingdale Township parcels are serviceable, mostly by Bloomingdale Communications (dark blue). MEC has service available as an option to Bloomingdale Communications (yellow/blue gradient) along the south edge and through the center of the township.

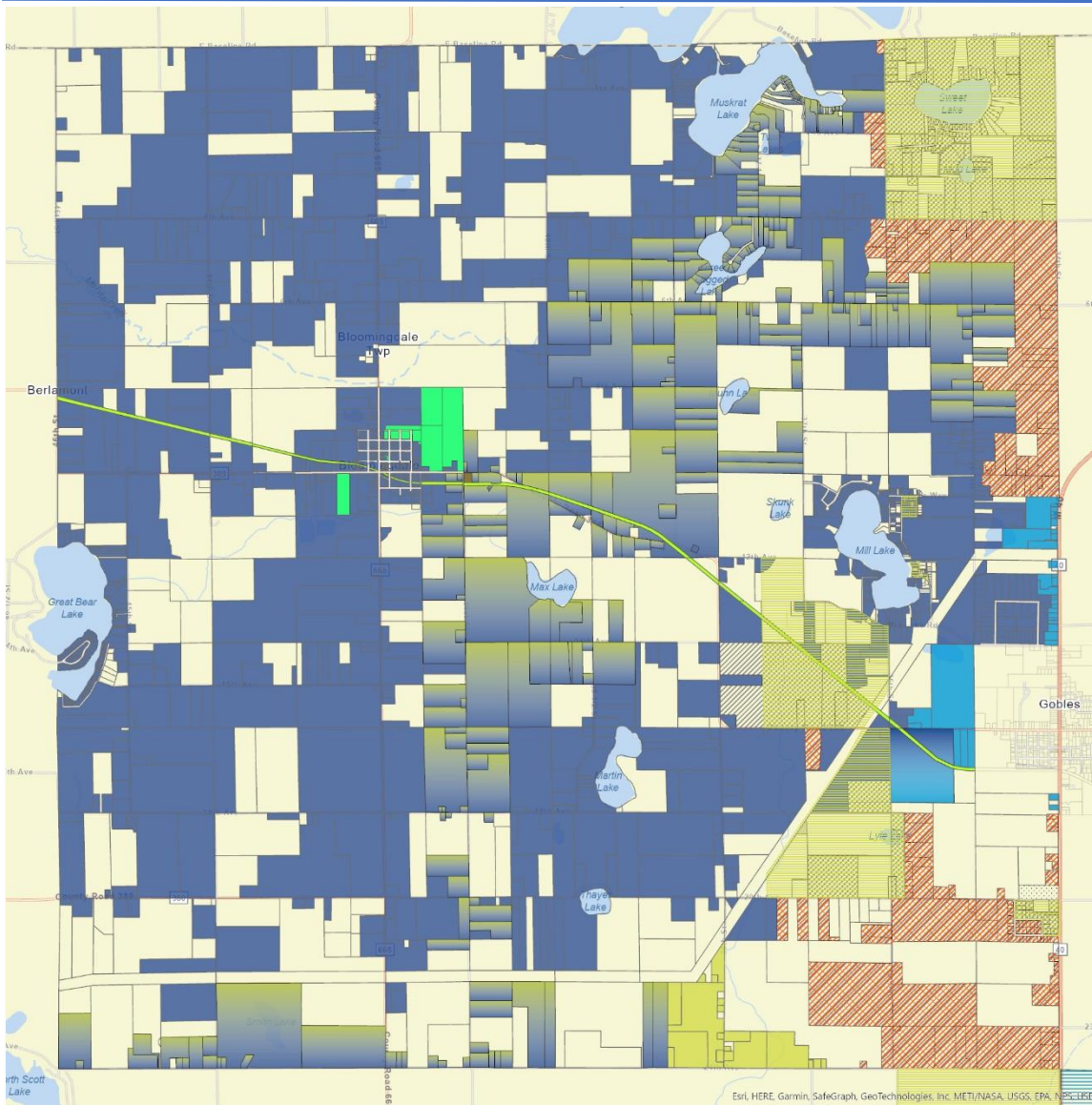
Charter Communications also has some service areas around the City of Gobles (light blue)

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



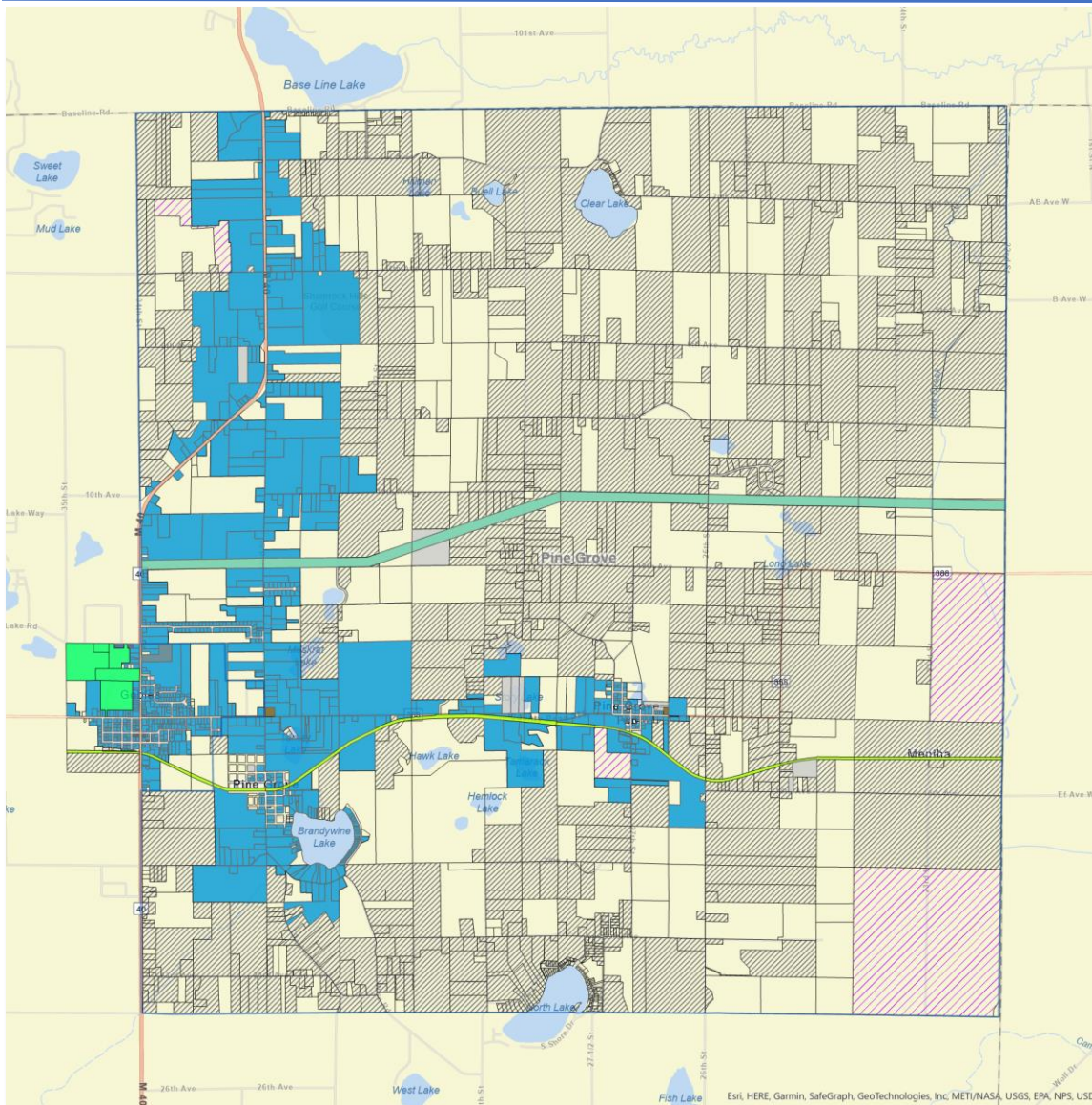
Current Grant Programs

MEC has been awarded some unserved areas on the east side of the township, which includes some high density build around Sweet and Mill Lakes.



Gaps still to be filled

After RDOF there remains about 155 parcels unserved, all on the east side of the township. Obviously, Bloomington Communications and MEC are well positioned to offer service in these remaining areas, but Charter Communications is also in a good position since they are already adjacent to some of the unserved areas. An estimate of construction in these areas is between \$852K and \$1.7M.

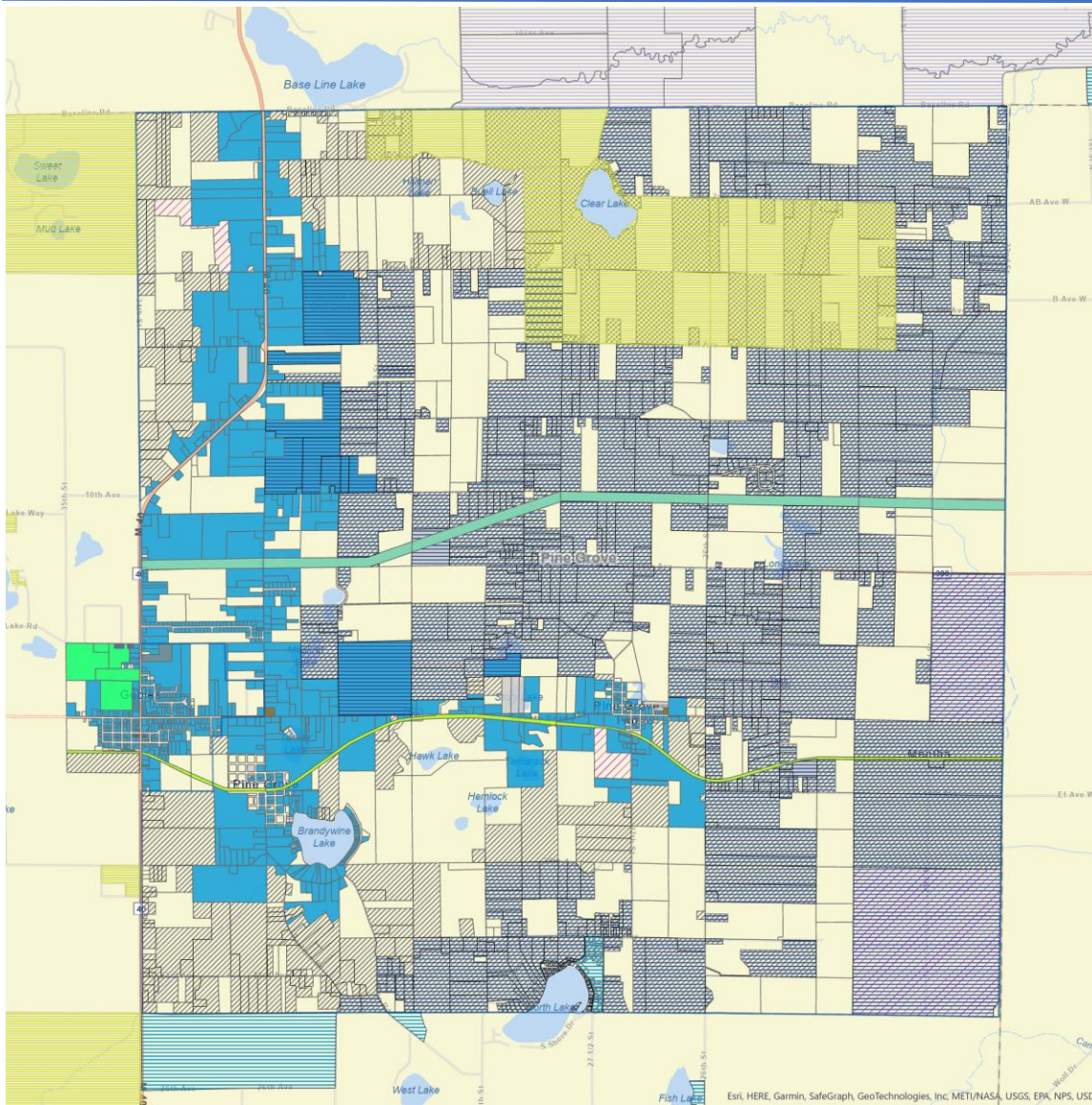


Pine Grove Township

Total Parcels	2316
Undeveloped/Unoccupied	409
Occupied Parcels	1907
Unserved (including Ag)	946
Served Parcels	961
Grant Funded Parcels (approx.)	717
Gap Parcels	229

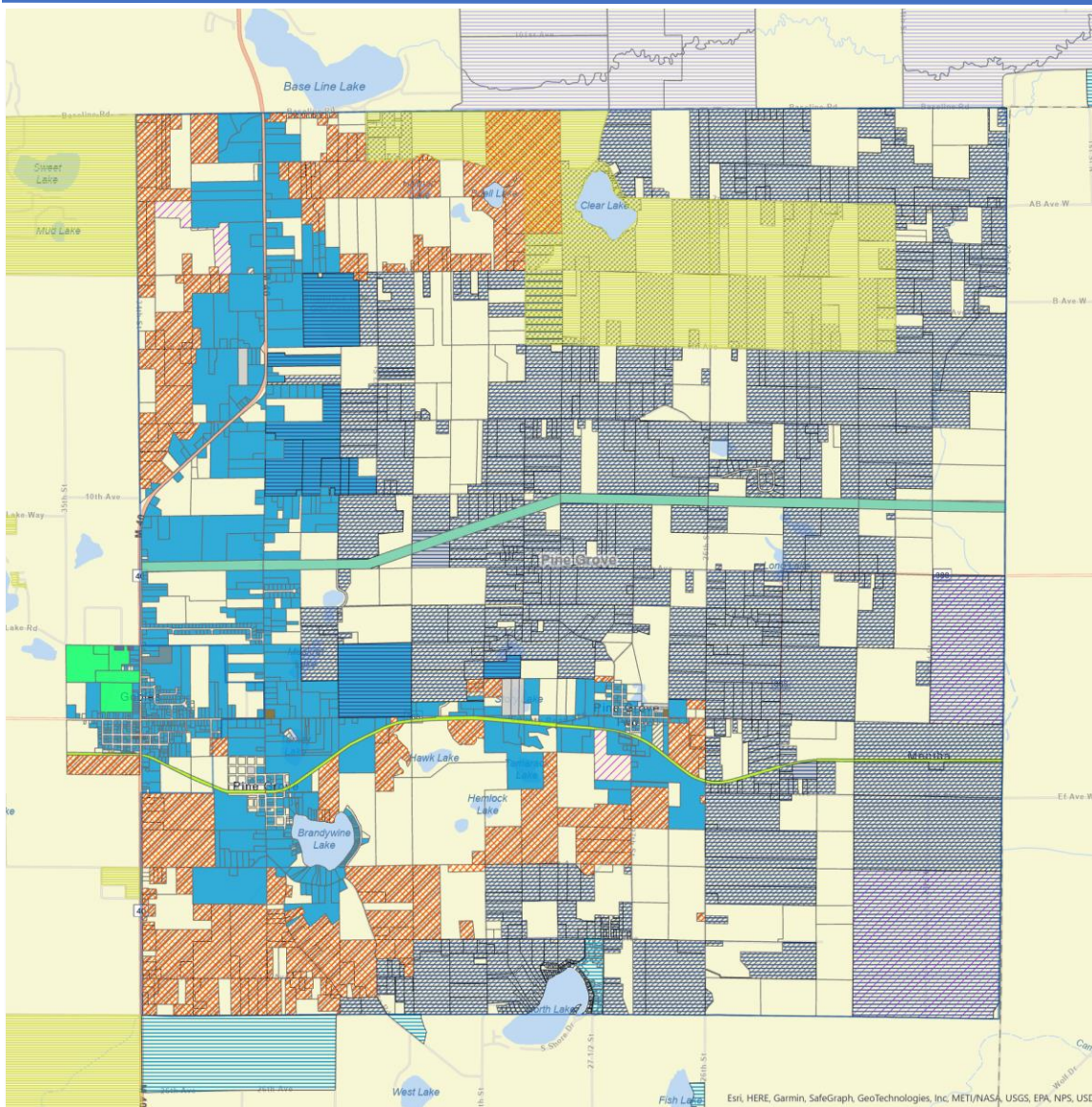
Charter Communications (blue) is the largest ISP in Pine Grove Township, serving about 961 parcels, or about 50%, leaving about 50% unserved, but that is in part due to the City of Gobles being included in the numbers. Regardless, that means 946 occupied parcels are currently unserved.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



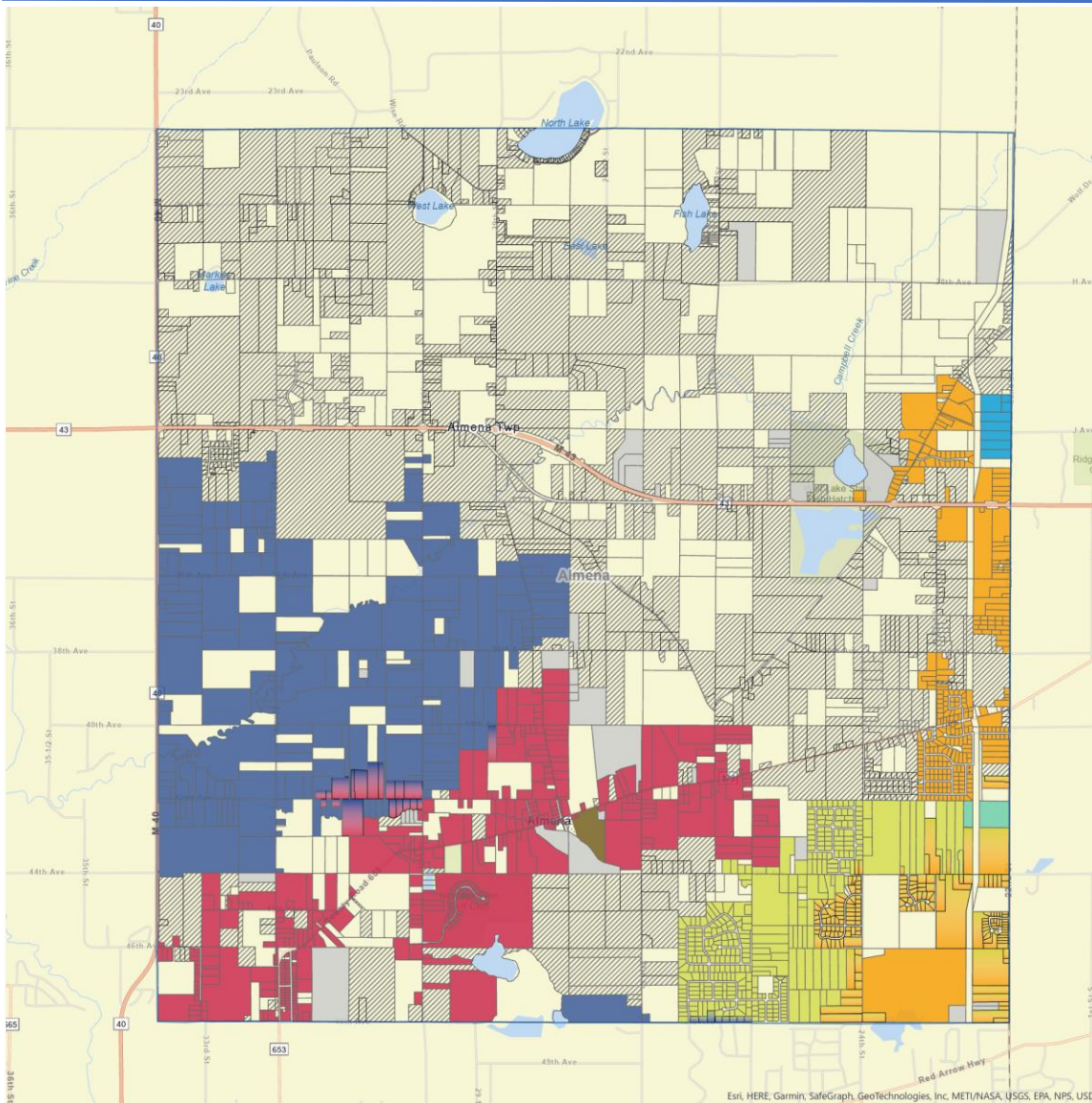
Current Grant Programs

Between RDOF and ReConnect, approximately 76% of the currently unserved areas are scheduled to be serviced by Charter Communications, MEC and Bloomingdale Communications. Which leaves about 229 parcels with no plans for service. Unlike Arlington Township though, the two federal programs do not overlap much, although there does appear to be some Charter served parcels that may have been identified as unserved by the ReConnect program (Dk Blue horizontal hatch on the lighter blue Charter service areas). What has occurred though, due to the historical mapping issues, is the path for getting service to the entire township is not as clear.



Gaps still to be filled

Any of the three ISPs, Charter, MEC, or Bloomingdale communications are in a good position for reaching all of the remaining Gap areas, and perhaps the most practical approach is simply a blanket RFP for all remaining unserved parcels in the township. The estimate to complete Pine Grove is between \$1.26M and \$2.3M.

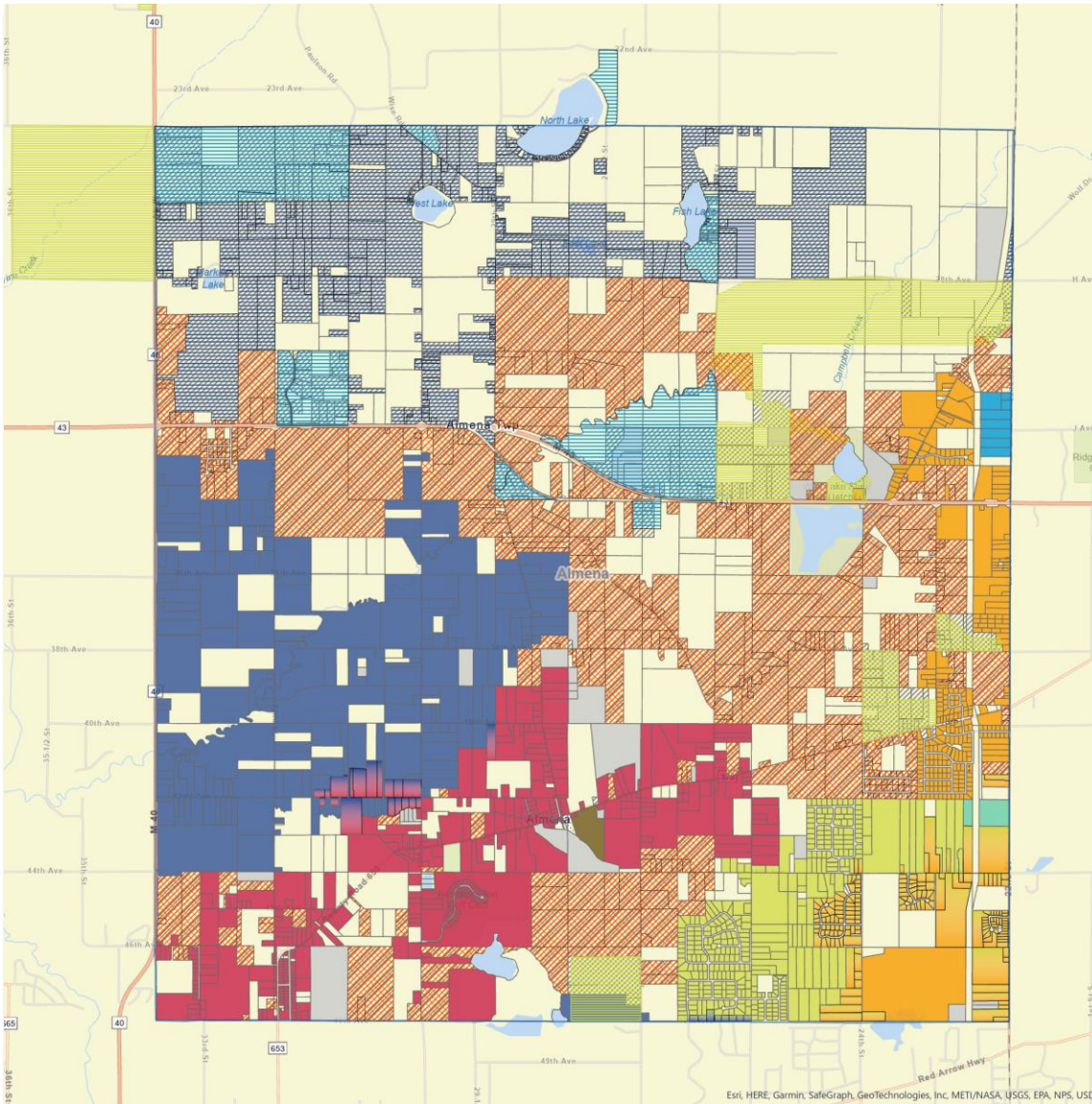


Almena Township

Total Parcels	2675
Undeveloped/Unoccupied	384
Occupied Parcels	2291
Unserved (including Ag)	854
Served Parcels	1437
Grant Funded Parcels (approx.)	384
Gap Parcels	470

Almena Township has several service providers. Bloomingdale Communications (dark blue), Comcast (red) MEC (yellow) Mediacom (orange) and Charter (light blue along the east edge) which is an extension of their network from Kalamazoo. There are also several areas with two providers (gradient colors indicate who the providers are). Although much of the south side of this township has several providers, they are also tied with Columbia Township with the second most Gap Parcels in the county.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



Like Pine Grove, Alma Township has federal grant areas from both RDOF and ReConnect, awarded to the same three ISPs, Charter, MEC and Bloomingdale Communications. All of the grant funded areas are in the northern half of the township, but the 470 remaining parcels are spread across the entire township offering many possibilities.

Almena Township also has the most existing ISPs with 5 major ISPs providing service in parts of the township. Each of the ISPs, Charter, Comcast, Bloomingdale Communications, MEC and Mediacom each have some strategic value in planning to reach the remaining 470 parcels and dividing it up based on where each are located may have a lot of cost advantage. The estimated costs to complete Almena are between \$2.12M and \$4.7M.



Commission District 4

Commissioner Mike Chappell

Bangor Township

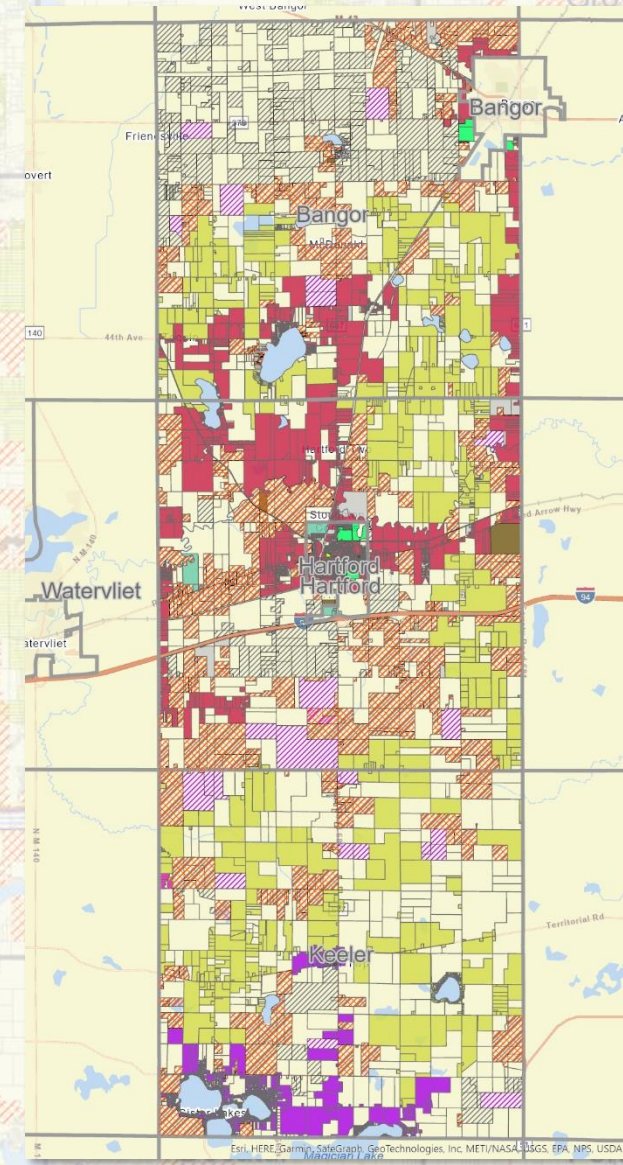
Hartford Township

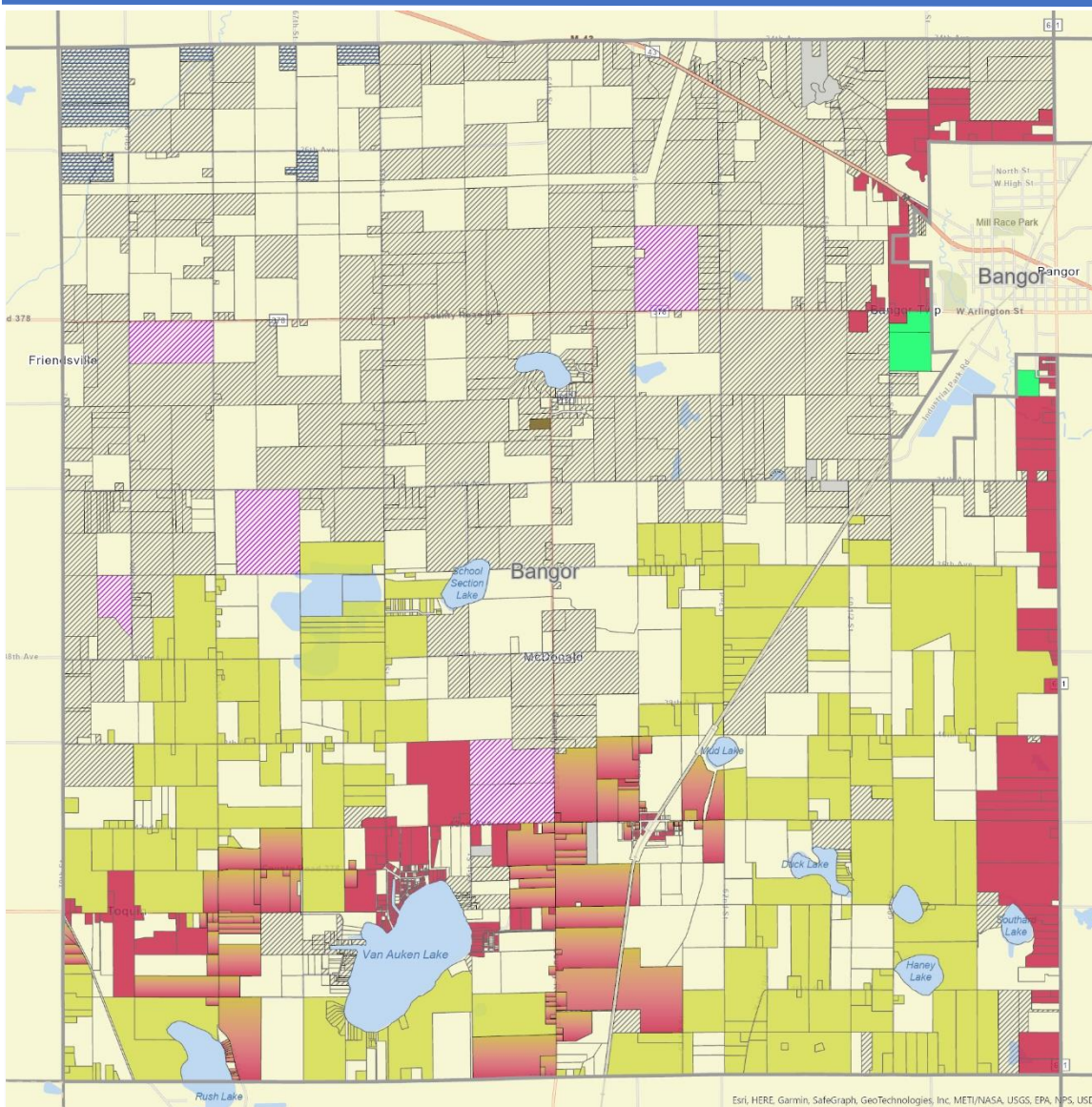
City of Hartford

Keeler Township

Total Parcels	6596
Undeveloped/Unoccupied	1449
Occupied Parcels	5147
Unserved (including Ag)	1221
Served Parcels	3926
Grant Funded Parcels (approx.)	436
Gap Parcels	785

The Gap filling requirements for this district are similar with Gaps spread out across all three townships, making it less likely to bundle areas for outside providers. MEC, Comcast and Sister Lakes Cable are best positioned to reach all of the corners of this district. The cost estimates for the Gap filling effort is between \$4M and \$7.66M.



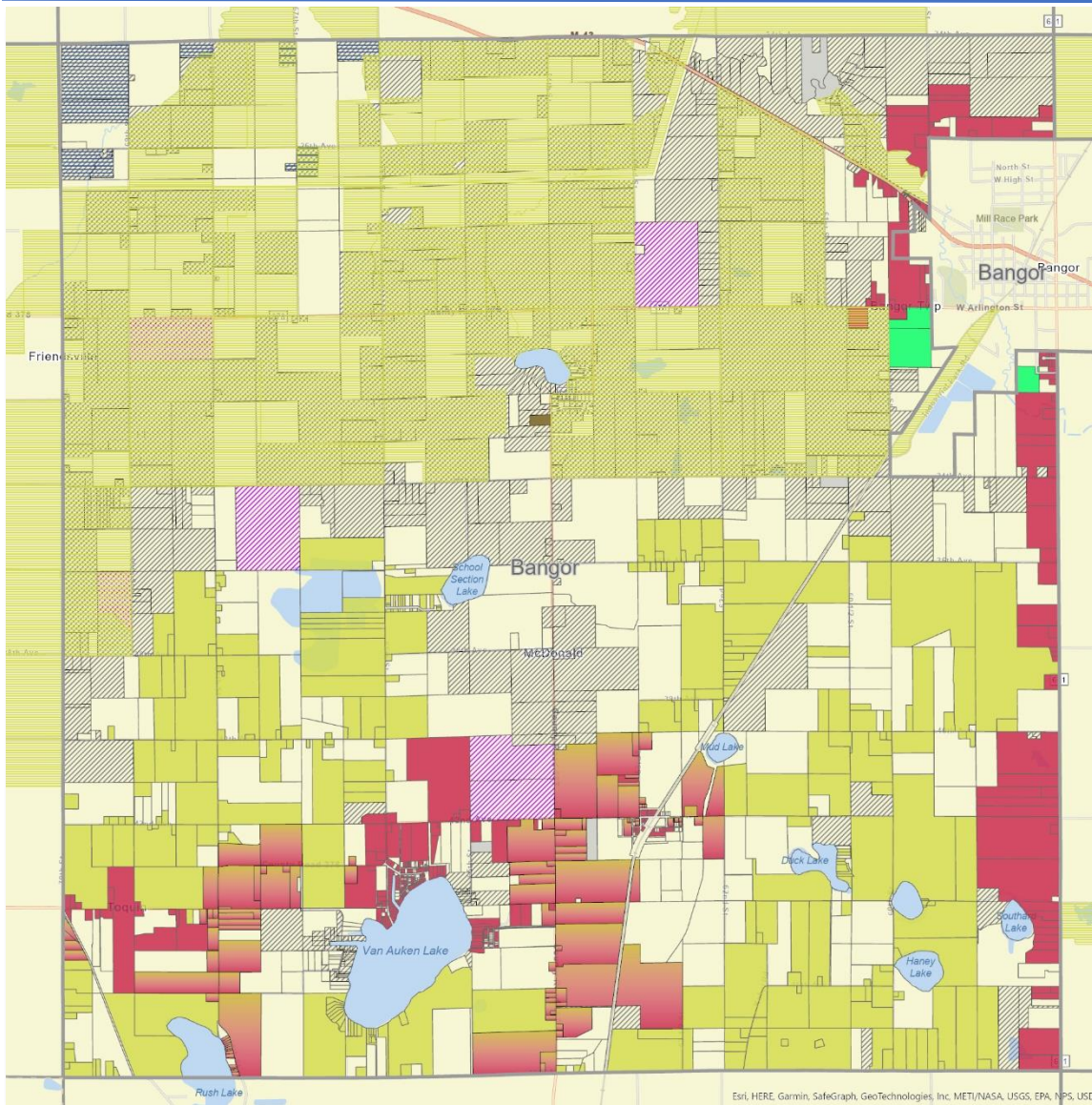


Bangor Township

Total Parcels	1673
Undeveloped/Unoccupied	463
Occupied Parcels	1210
Unserved (including Ag)	550
Served Parcels	660
Grant Funded Parcels (approx.)	300
Gap Parcels	250

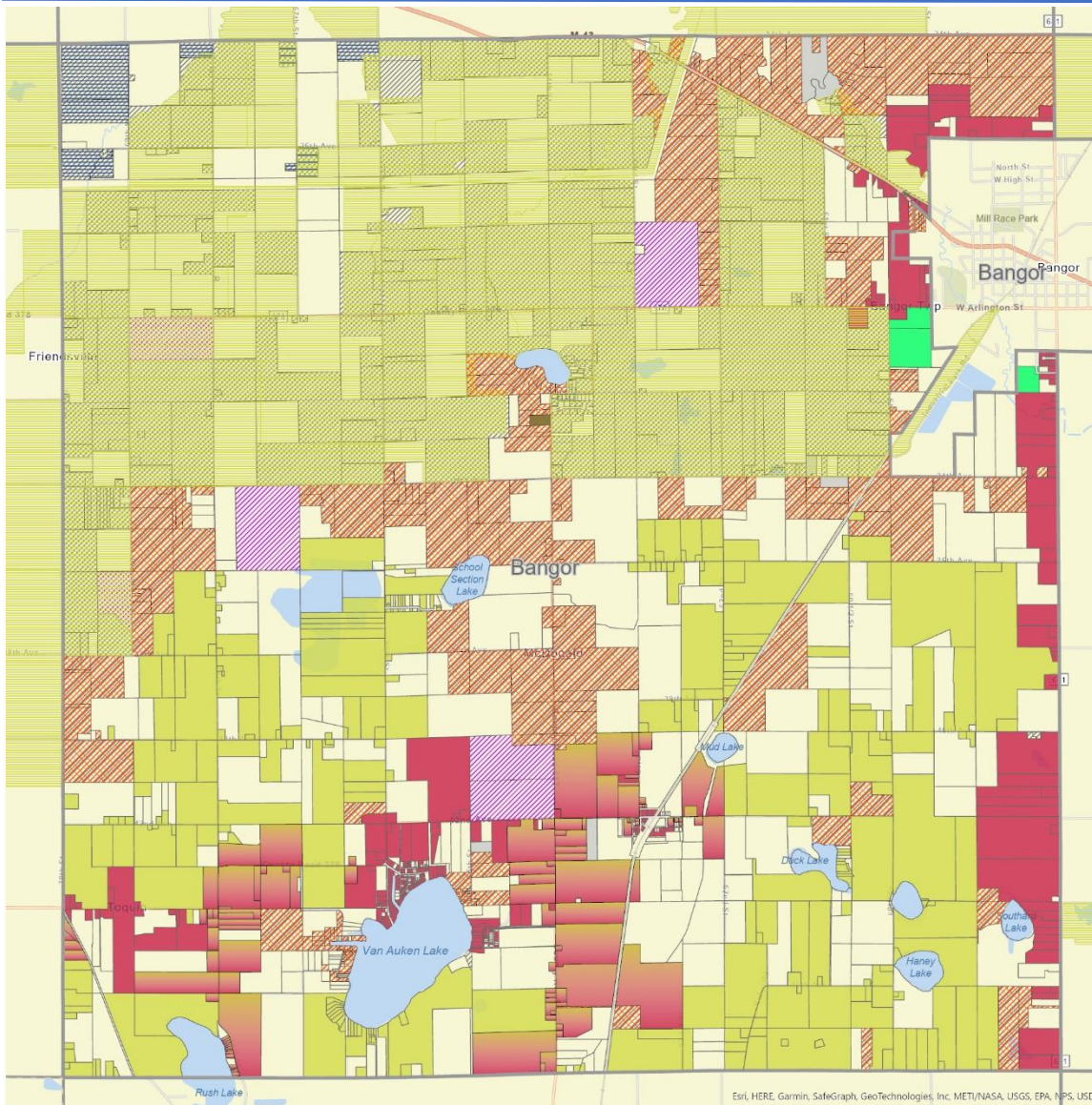
Bangor Township is served by Comcast (red) and MEC (yellow) with some overlapping areas. Most of the existing service area is limited to the southern half of the township. The northern half is mostly slated for RDOF funding, but Gaps remain across the whole township.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



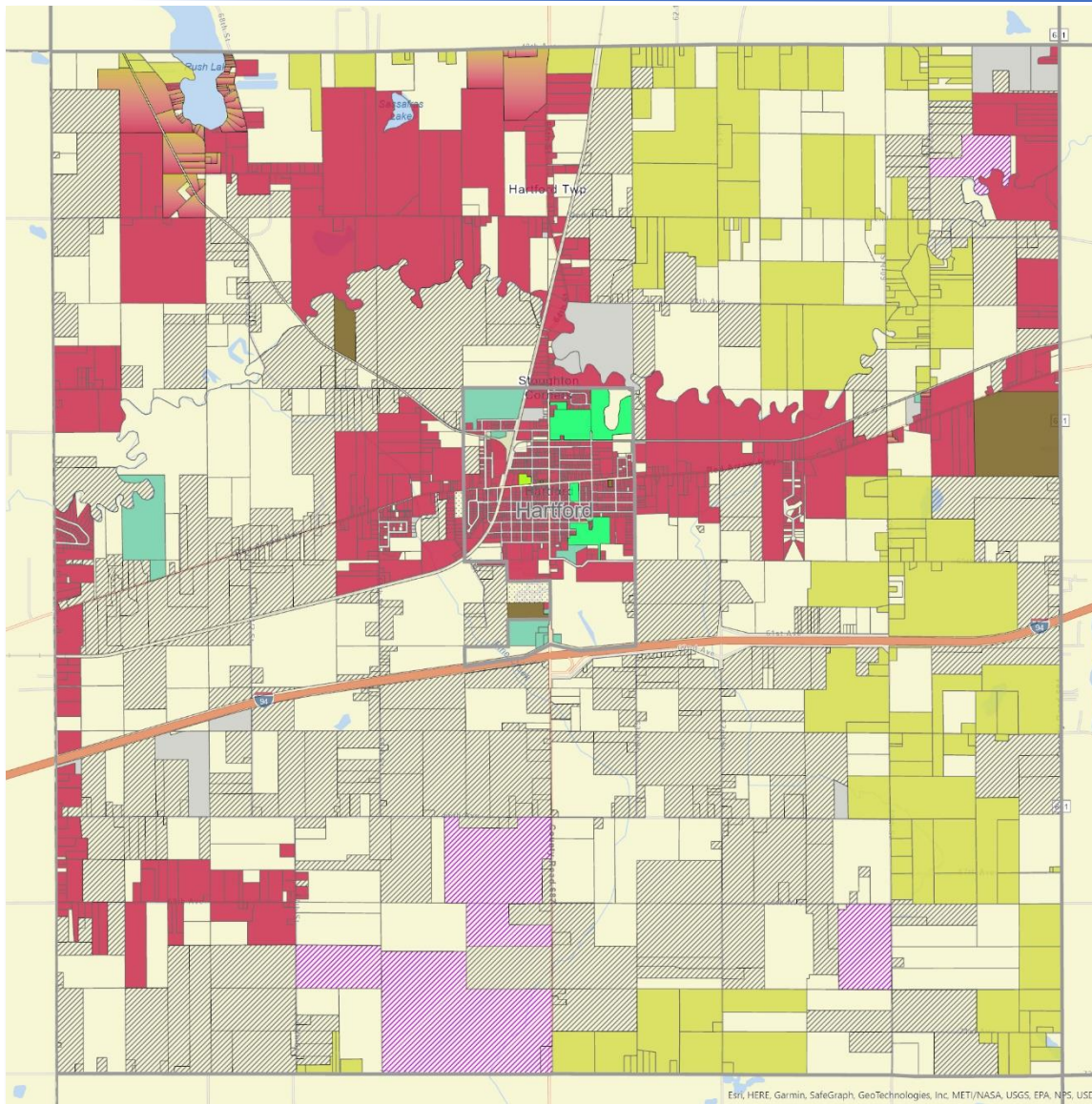
Current Grant Programs

MEC was awarded approximately 300 parcels across the northern half of the township. Bloomingdale is building some areas in the NW corner as part of the ReConnect funding they are using in Geneva Township.



Gaps still to be filled

After RDOF and ReConnect, 250 parcels remain adjacent to areas served by MEC and Comcast, but none close to Bloomingdale Communications. There are also small Gaps around Van Auken Lake and other isolated areas across the south end of the township, which could be easily reached by either ISP, but probably not practical for an outside ISP to try to build. The extensions into these smaller areas could still be competed through an RFP process but would likely be responded to by only Comcast and MEC. The estimated costs for filling all gaps in Bangor Townships is between \$1.125M and \$2.375M.

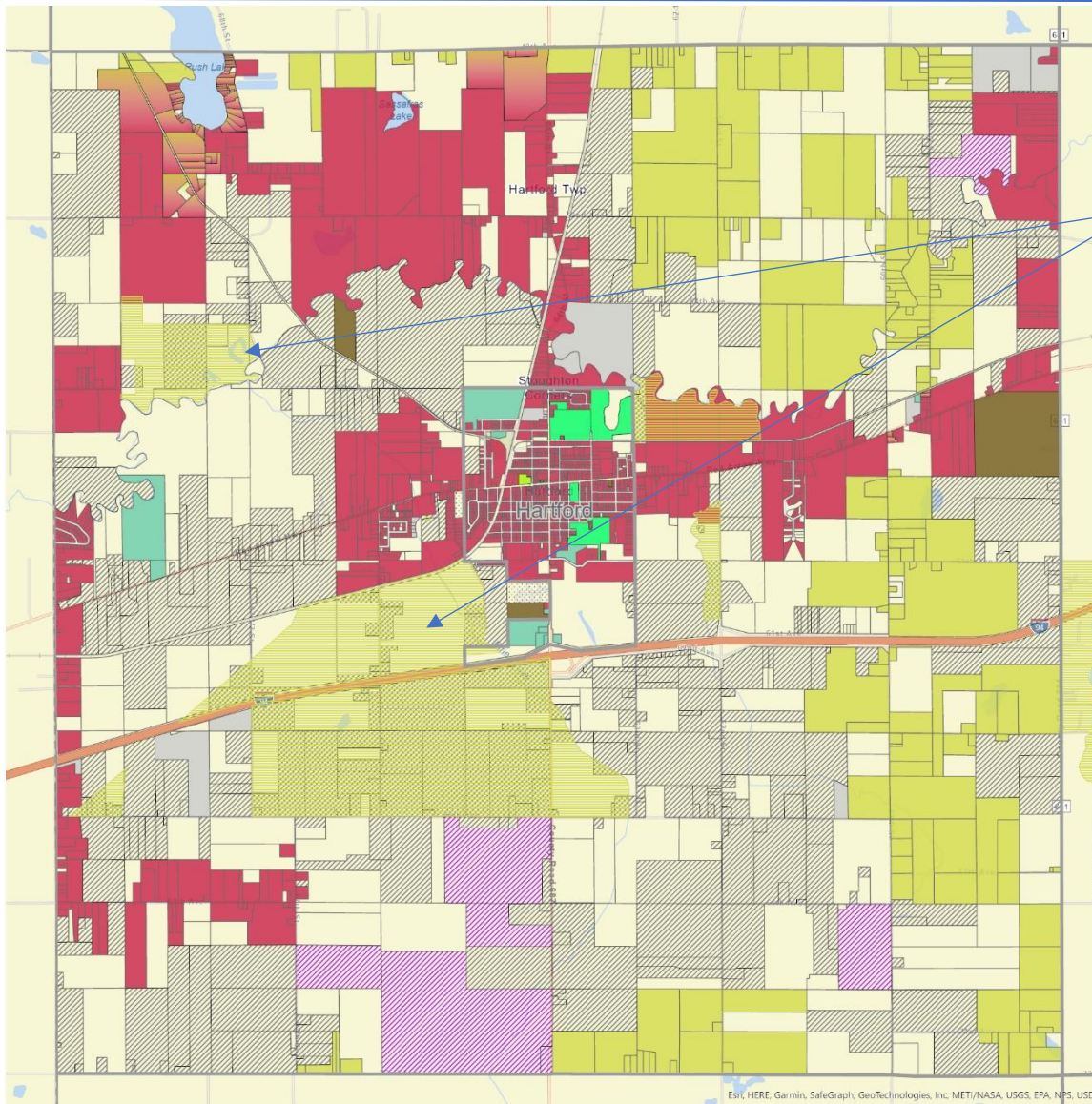


Hartford Township

Total Parcels	2590
Undeveloped/Unoccupied	349
Occupied Parcels	2241
Unserved (including Ag)	497
Served Parcels	1744
Grant Funded Parcels (approx.)	86
Gap Parcels	411

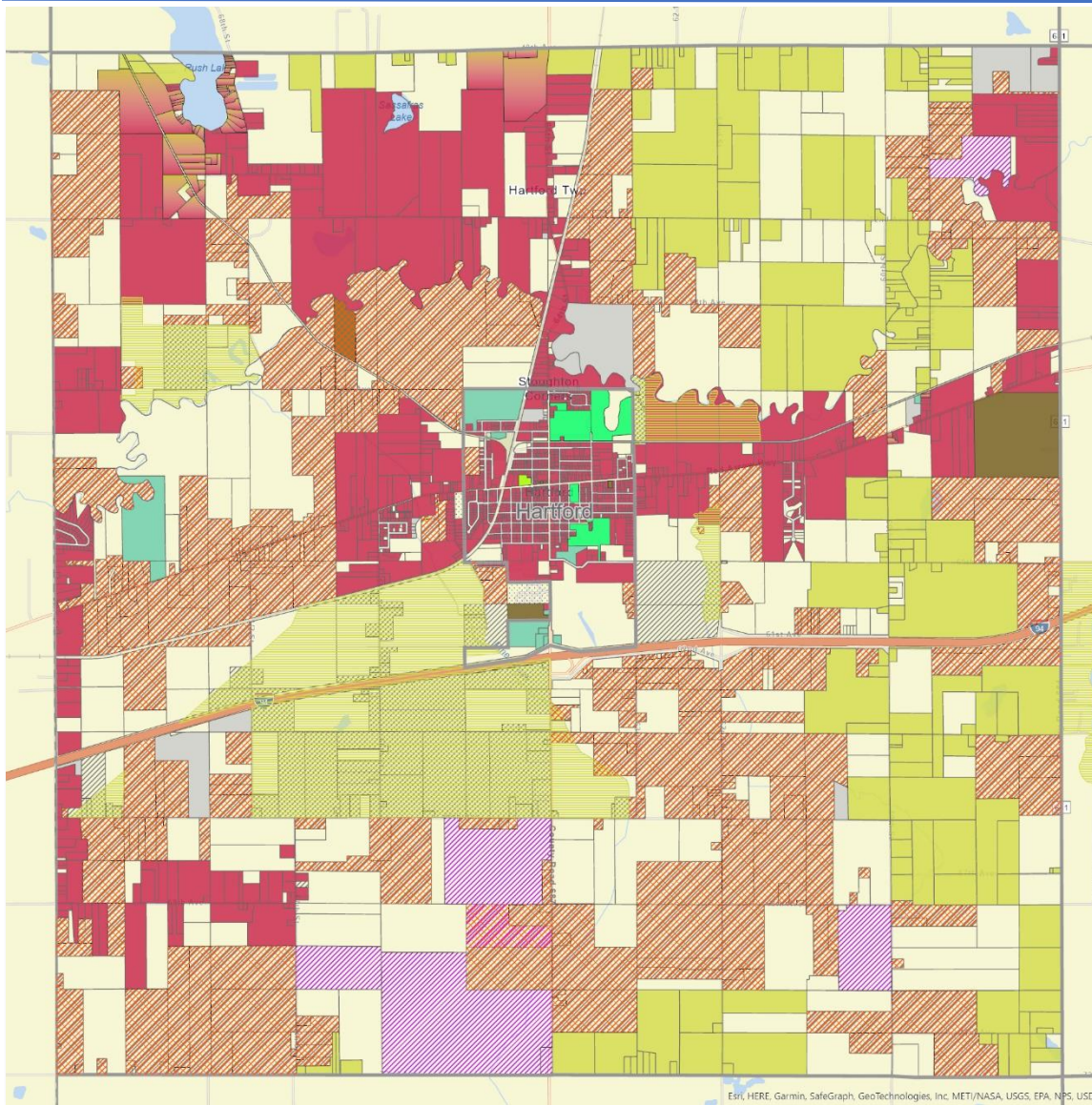
Hartford Township's two primary ISPs are Comcast (red) and MEC (yellow). There is some overlap in their systems offering some residents a choice (yellow/red gradient). 22% of the township is unserved today, including a few isolated parcels inside the Comcast service area in, and around the City of Hartford.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



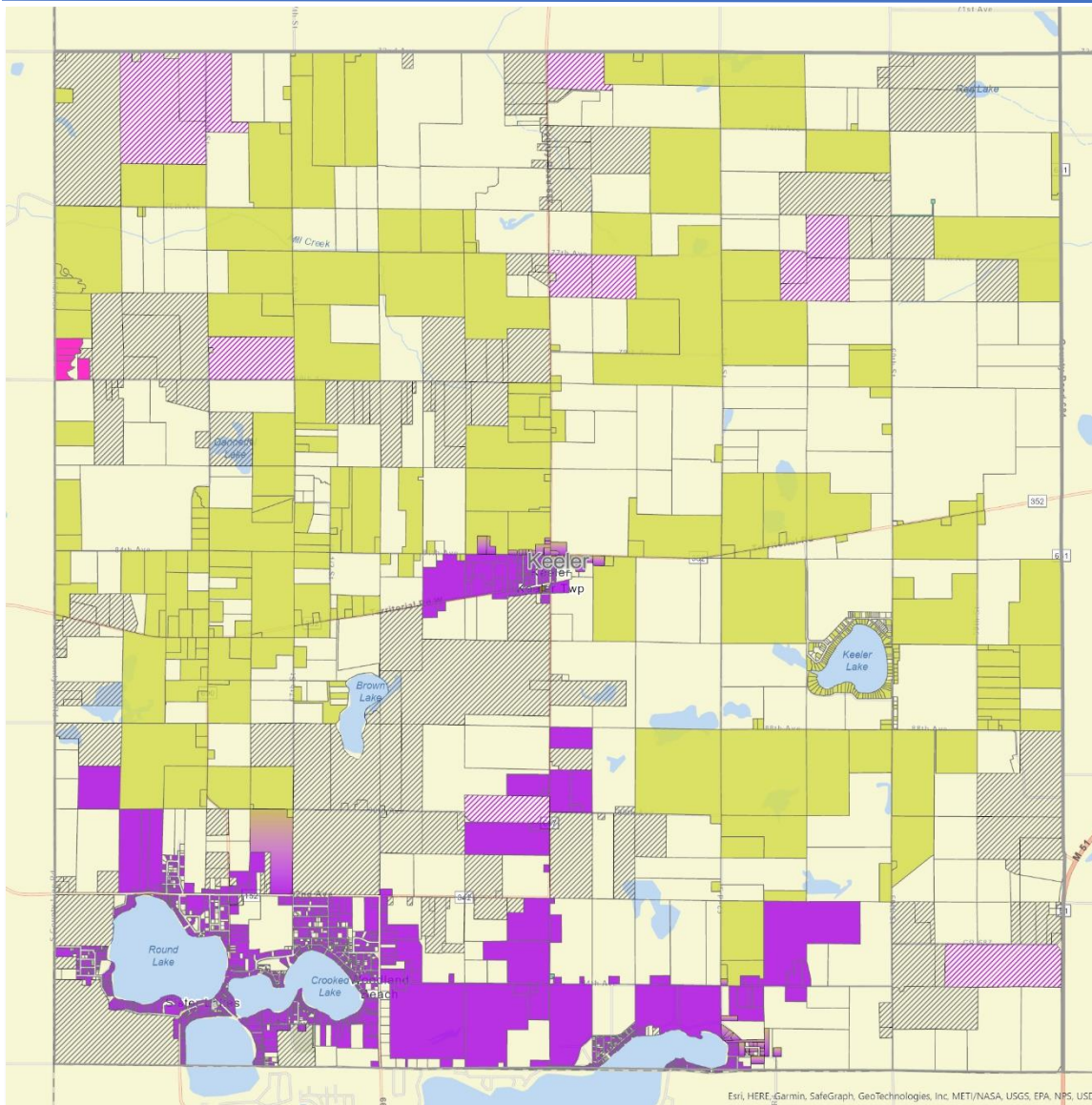
Current Grant Programs

Hartford Township has approximately 86 parcels planned under the RDOF program with MEC (yellow hatched areas). These areas are not contiguous with their existing systems, which means they will need to be building through some of the remaining Gap areas.



Gaps still to be filled

18% of the township (411 Gap parcels) will remain unserved after RDOF is completed. Both Comcast and MEC are well positioned in the township to be potential providers for the remaining Gaps, and an outside ISP may have interest, but would likely want to overbuild existing ISP areas to strengthen a business case. Areas targeted for overbuild do not qualify for Grant Funding unless it is for the purposes of a backhaul to get to unserved areas. The estimates cost to complete the Gap areas in Hartford Township is between \$2.26M and \$4.11M.

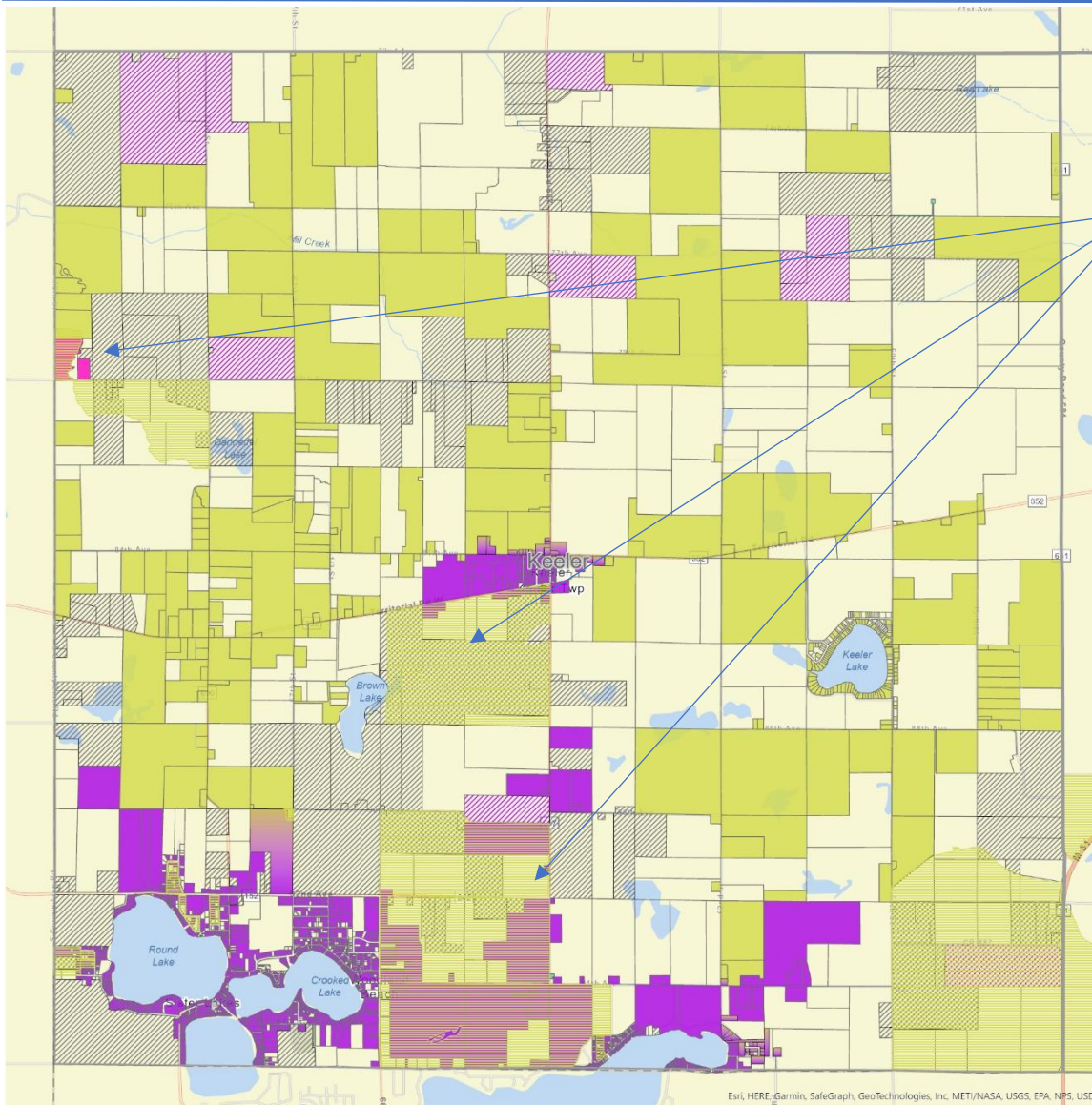


Keeler Township

Total Parcels	2333
Undeveloped/Unoccupied	637
Occupied Parcels	1696
Unserved (including Ag)	174
Served Parcels	1522
Grant Funded Parcels (approx.)	50
Gap Parcels	124

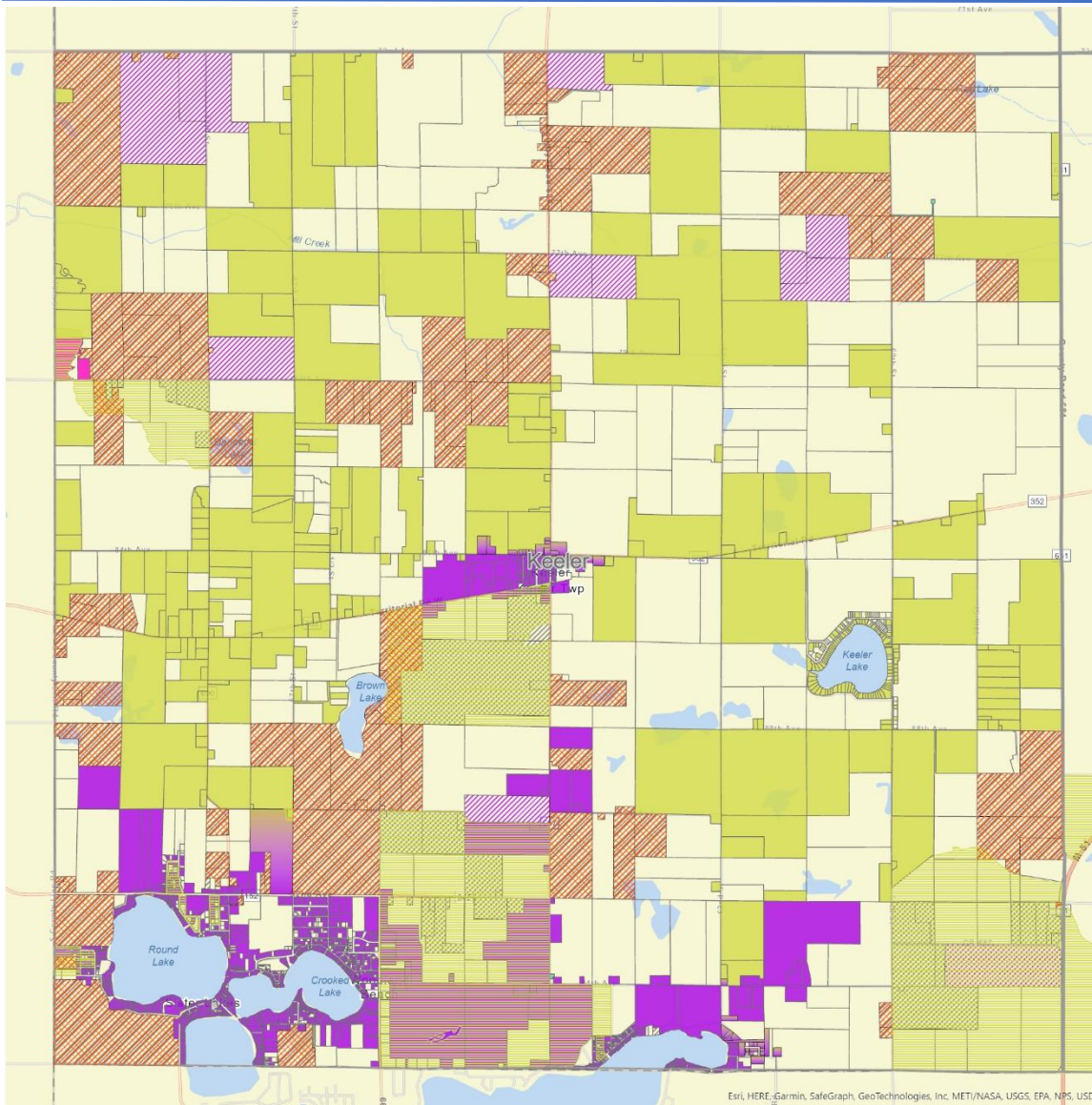
Keeler Township is 90% served by Sister Lakes Cable (purple areas around the Sister Lakes and Keeler Village) and by MEC (yellow) in the rural parts of the township. There is also a small extension by Michiana Supernet (magenta) along the western boundry of the County fed from Berrien County.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



Current Grant Programs

Due to how the current service areas are spread out, RDOF only qualified about 50 parcels, which were awarded to MEC. And many of those parcels awarded are already serviced by Sister Lakes Cable or Michiana Supernet, another known issue with how the FCC Form 477 and RDOF programs work.



Gaps still to be filled

The remaining Gap areas total 124 parcels, spread around the township, making them difficult to bundle for an outside ISP. MEC and Sister Lakes Cable are the two most practical sources to fill these gaps, and each have areas adjacent to their existing systems. The estimate cost to build fiber to the remaining 124 parcels in Keeler Township is between \$620K and \$1.18M.



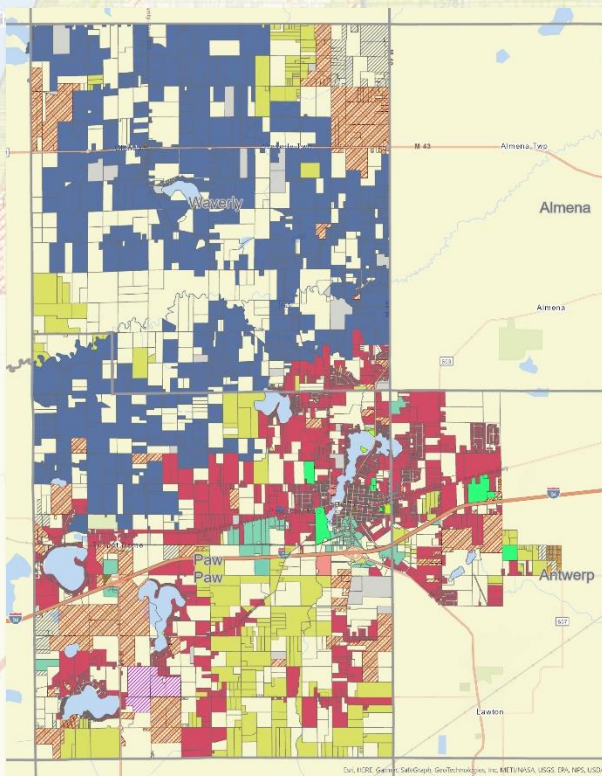
Commission District 5

Waverly Township

Village of Paw Paw

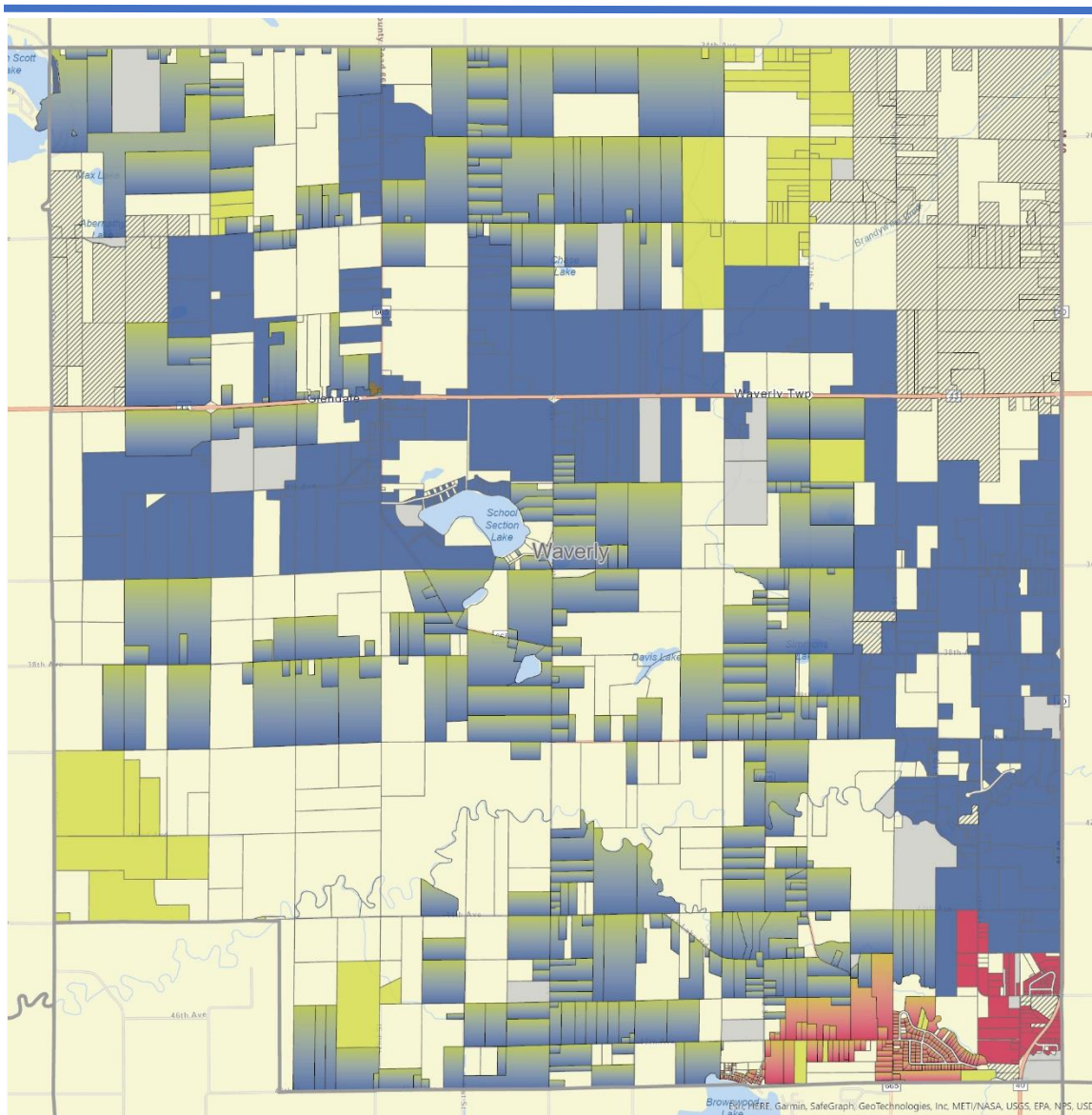
Paw Paw Township

Antwerp Township (See District 7 for full description)



Total Parcels	5395
Undeveloped/Unoccupied	896
Occupied Parcels	4499
Unserved (including Ag)	229
Served Parcels	4270
Grant Funded Parcels (approx.)	64
Gap Parcels	165

District 5 includes part of Antwerp Township, but because the study was segmented by Township, the parcel and cost data for Antwerp Township is in the section for District 7. The Parcel and cost data in this section are for Waverly and Paw Paw Townships, and the Village of Paw Paw. The overall Gap filling requirements for the district are also the lowest in cost and unserved areas of all seven districts. The estimated cost to fill all Gaps in District 5 is between \$660K and \$1.57M.

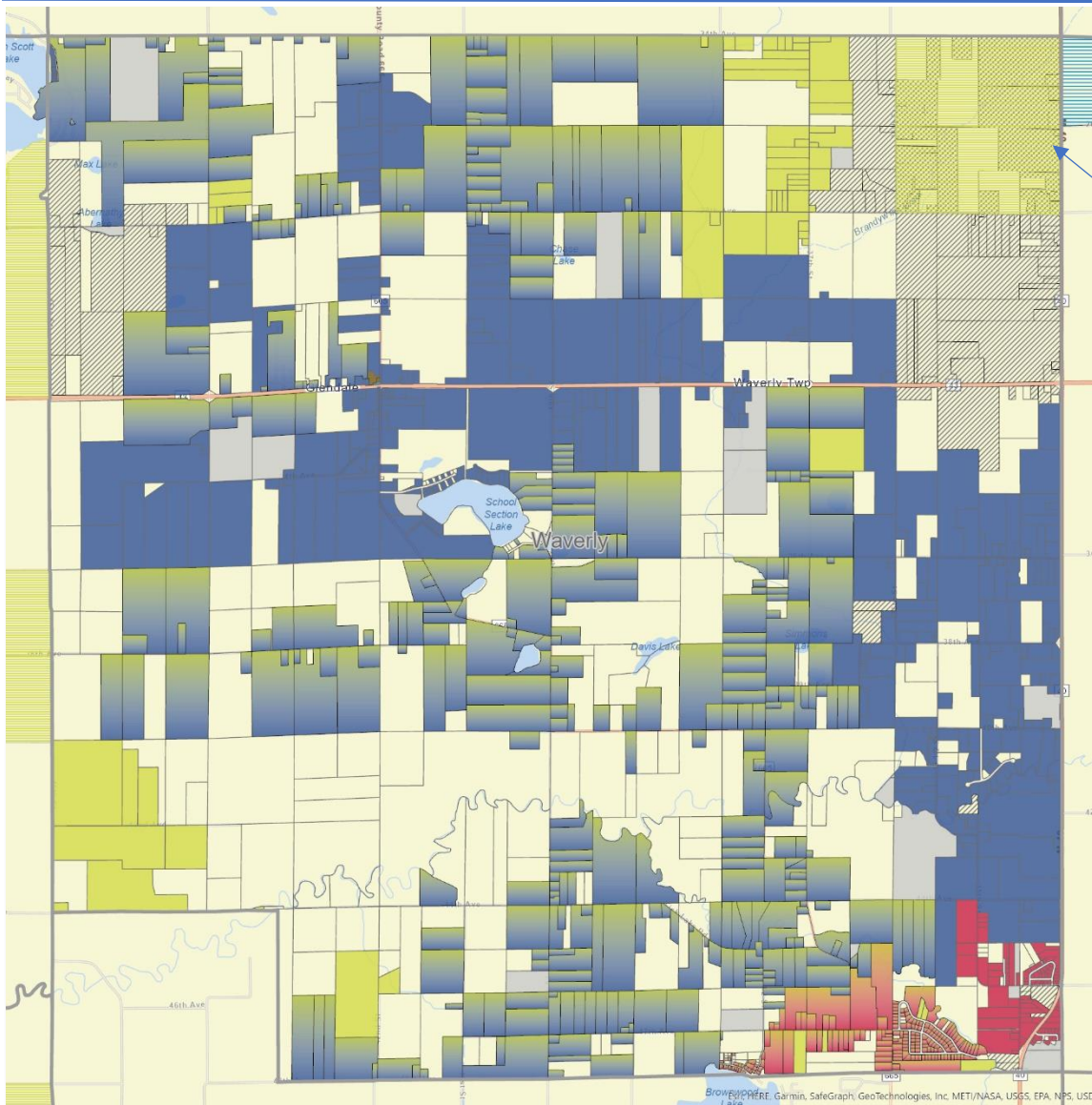


Waverly Township

Total Parcels	1493
Undeveloped/Unoccupied	321
Occupied Parcels	1172
Unserved (including Ag)	115
Served Parcels	1057
Grant Funded Parcels (approx.)	30
Gap Parcels	85

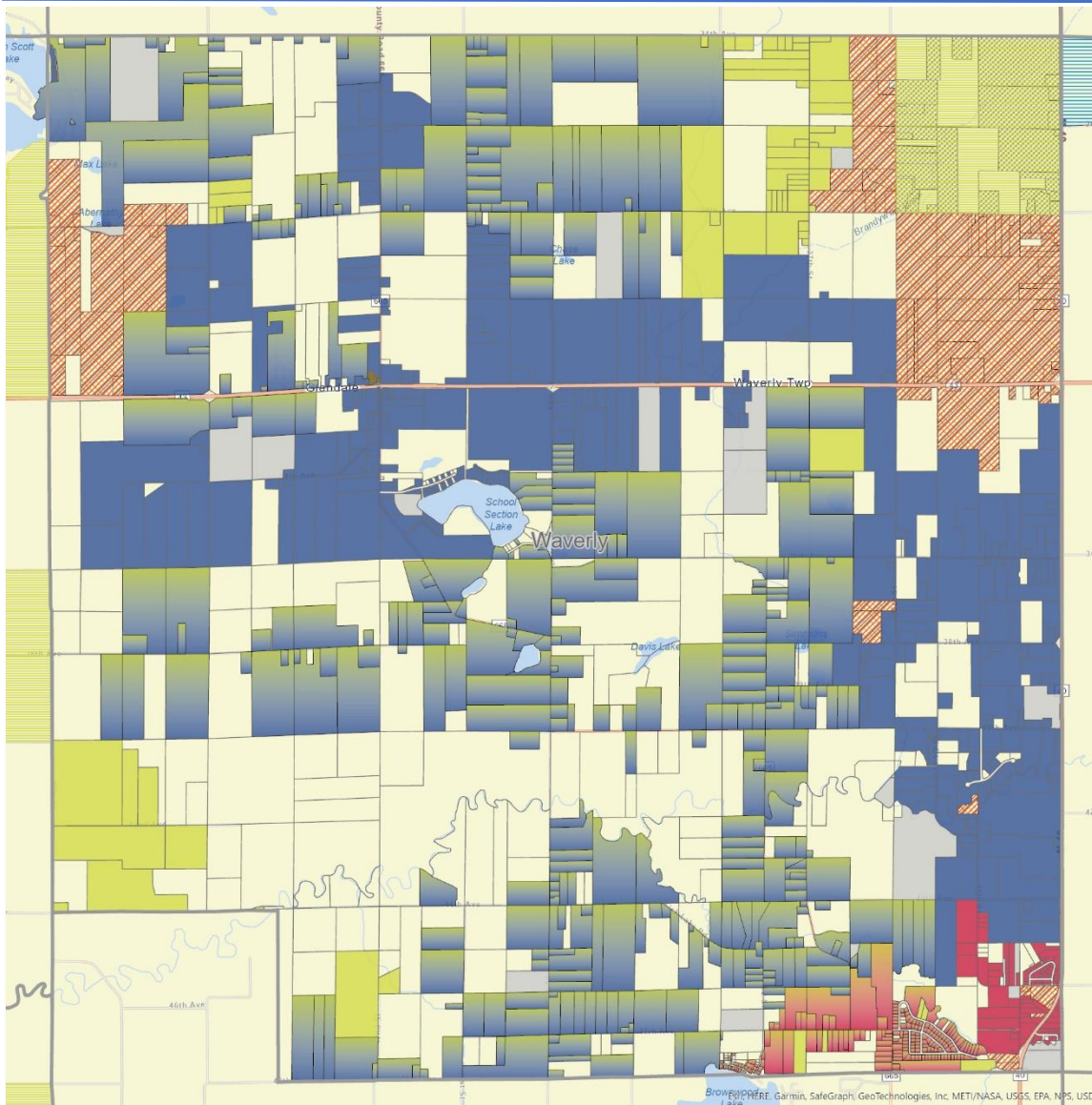
There are five out of the eighteen townships that are 90% or more served. Waverly is at 90%, and almost entirely fiber. In fact, most of it is two providers, (gradient yellow and blue parcels) MEC and Bloomingdale Communications, giving the residents of Waverly Township some excellent options for Broadband services. But 10% of the township still needs attention, and only a quarter of those currently unserved are slated for RDOF funding.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unservicable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



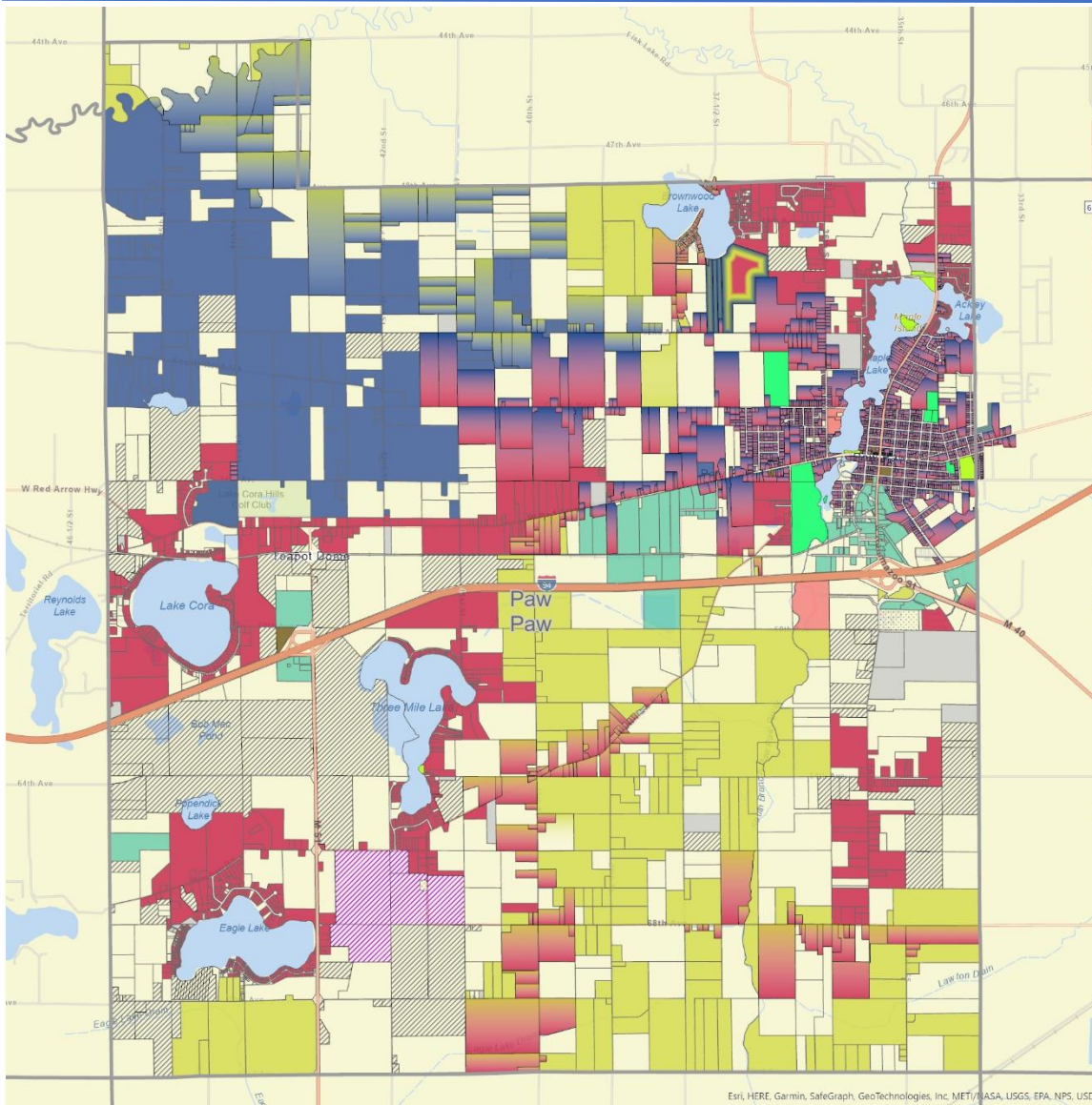
Current Grant Programs

RDOF funding has only been awarded in the NE corner of the township, to MEC. That area is surround by more unserved area that will need to be addressed as part of the Gap program, but it does position MEC well to be the provider for that whole area.



Gaps still to be filled

Bloomington Communications is also well positioned for the NE corner, as well as most of the remaining gaps around the township. There are a couple of small gaps in the SE corner with existing Comcast service areas, so they too should be offered an opportunity to discuss Gap filling for Waverly. In any case, the Gap filling requirements in Waverly are the second lowest in the county (second to Paw Paw Township which is also part of District 5), with only about 85 parcels to be connected. The cost estimated to complete Waverly Township is between \$340K and \$807k.

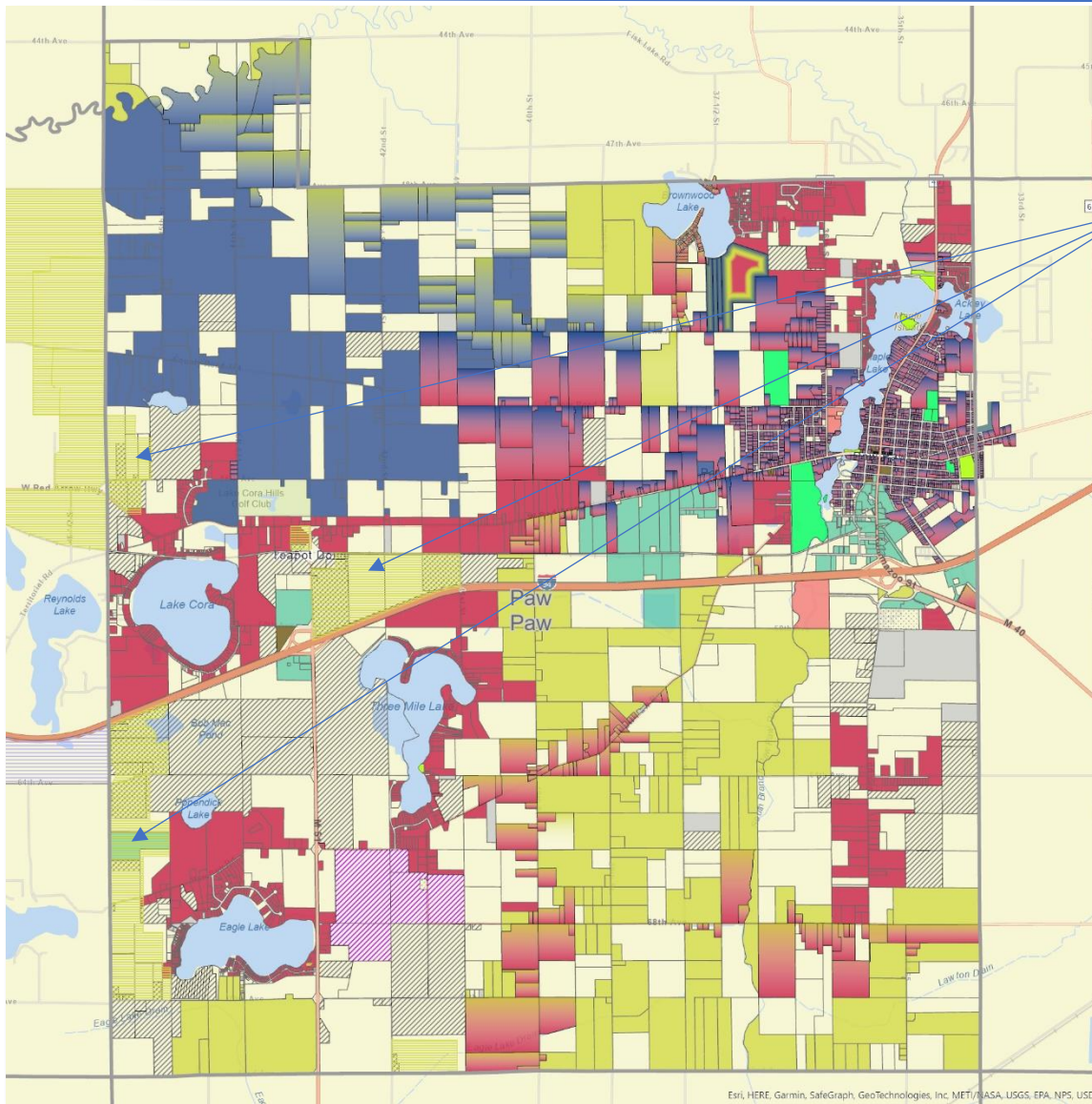


Paw Paw Township

Total Parcels	3902
Undeveloped/Unoccupied	575
Occupied Parcels	3327
Unserved (including Ag)	114
Served Parcels	3213
Grant Funded Parcels (approx.)	34
Gap Parcels	80

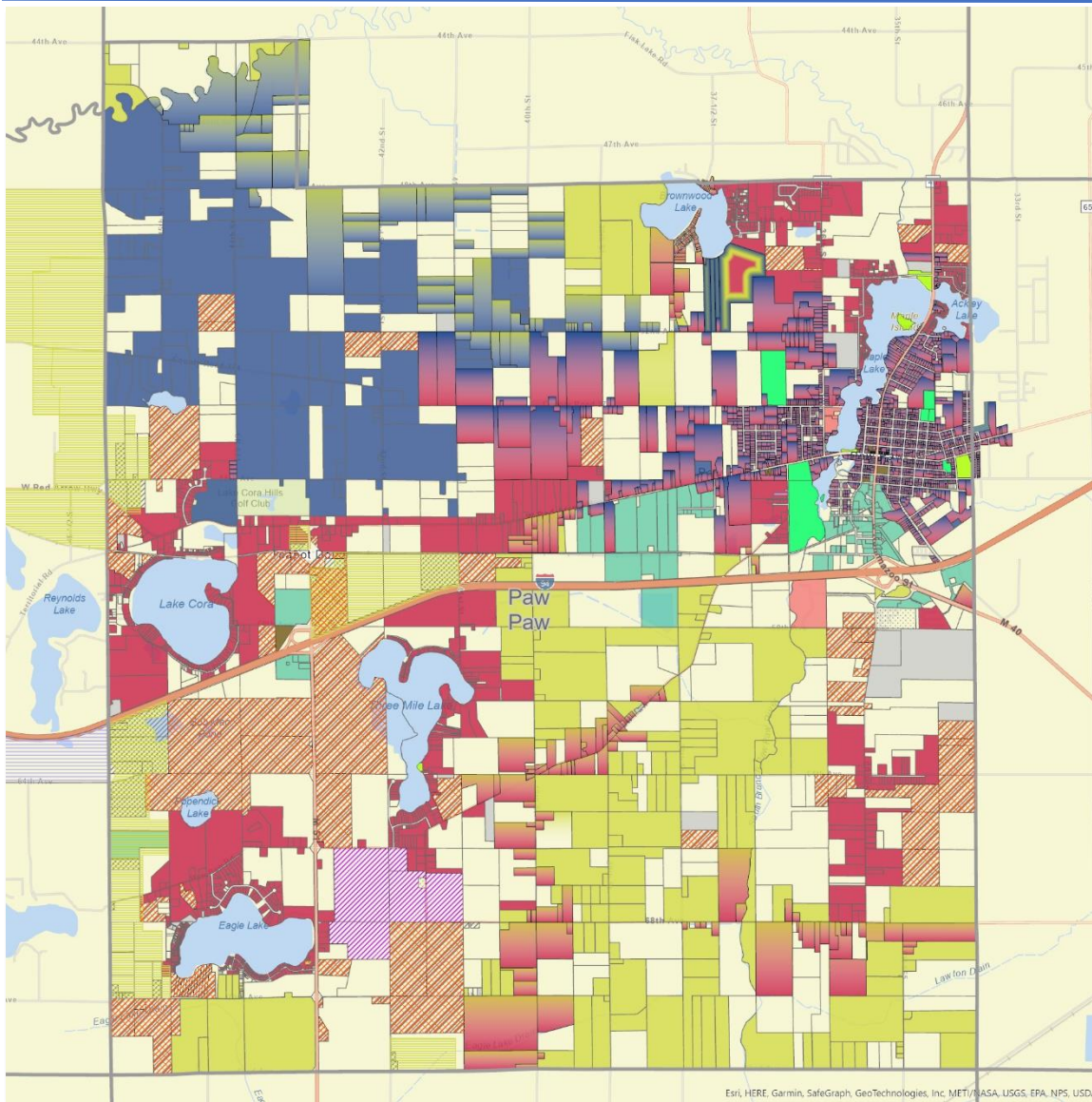
Paw Paw Township, along with the Village of Paw Paw has the highest ratio of servicable parcels in the county, at 97%. In many areas, residents have two, and even three options for Broadband services. But there are still some unserved residents and only part of them are covered by current Grants.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



Current Grant Programs

There are a few areas covered by RDOF grants, mostly along the west side of the township and all awarded to MEC.



There are Gap locations adjacent to the MEC RDOF areas, but these areas could be just as easily served by Comcast since they too have systems adjacent to them. This is the case for the remaining Gap areas around the township, both MEC and Comcast are well positioned to service the entire township with extensions from their existing networks. The cost estimated for completing Paw Paw 100% is between \$320K and \$760k.



Commission District 6

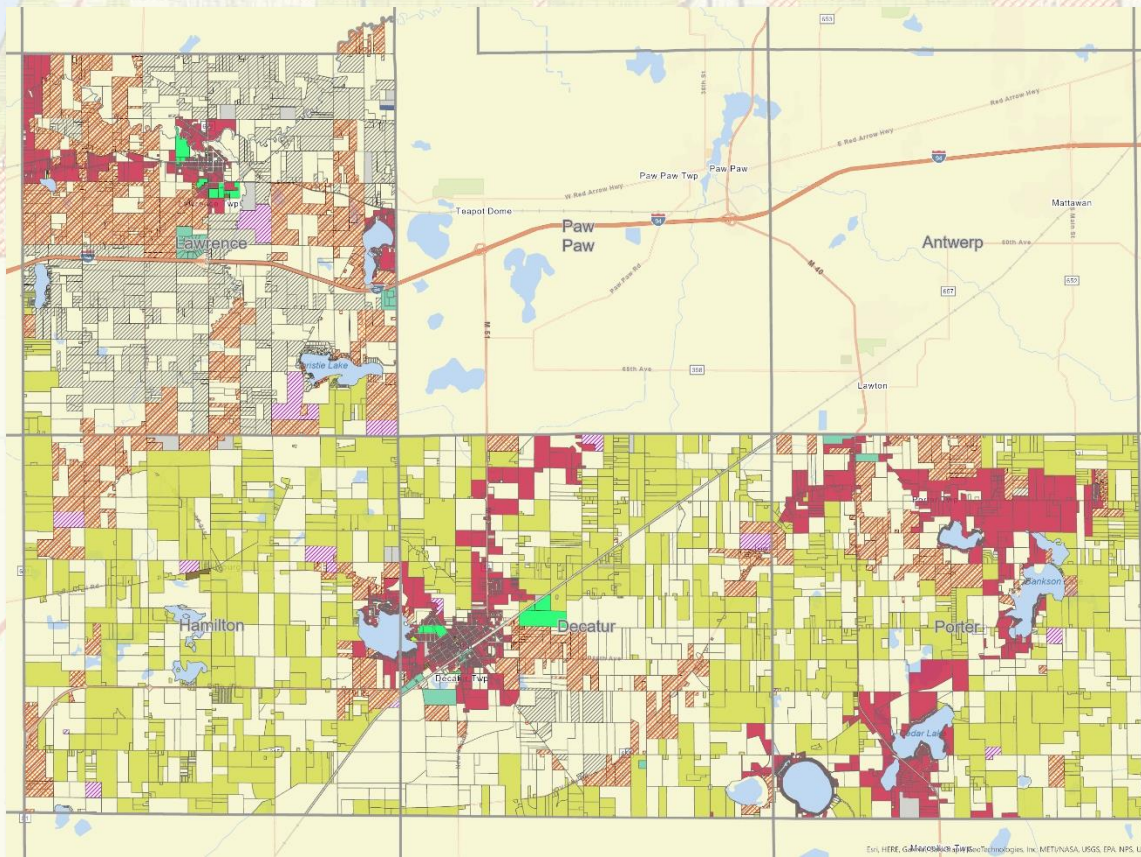
Commissioner Donald Hanson

Lawrence Township

Hamilton Township

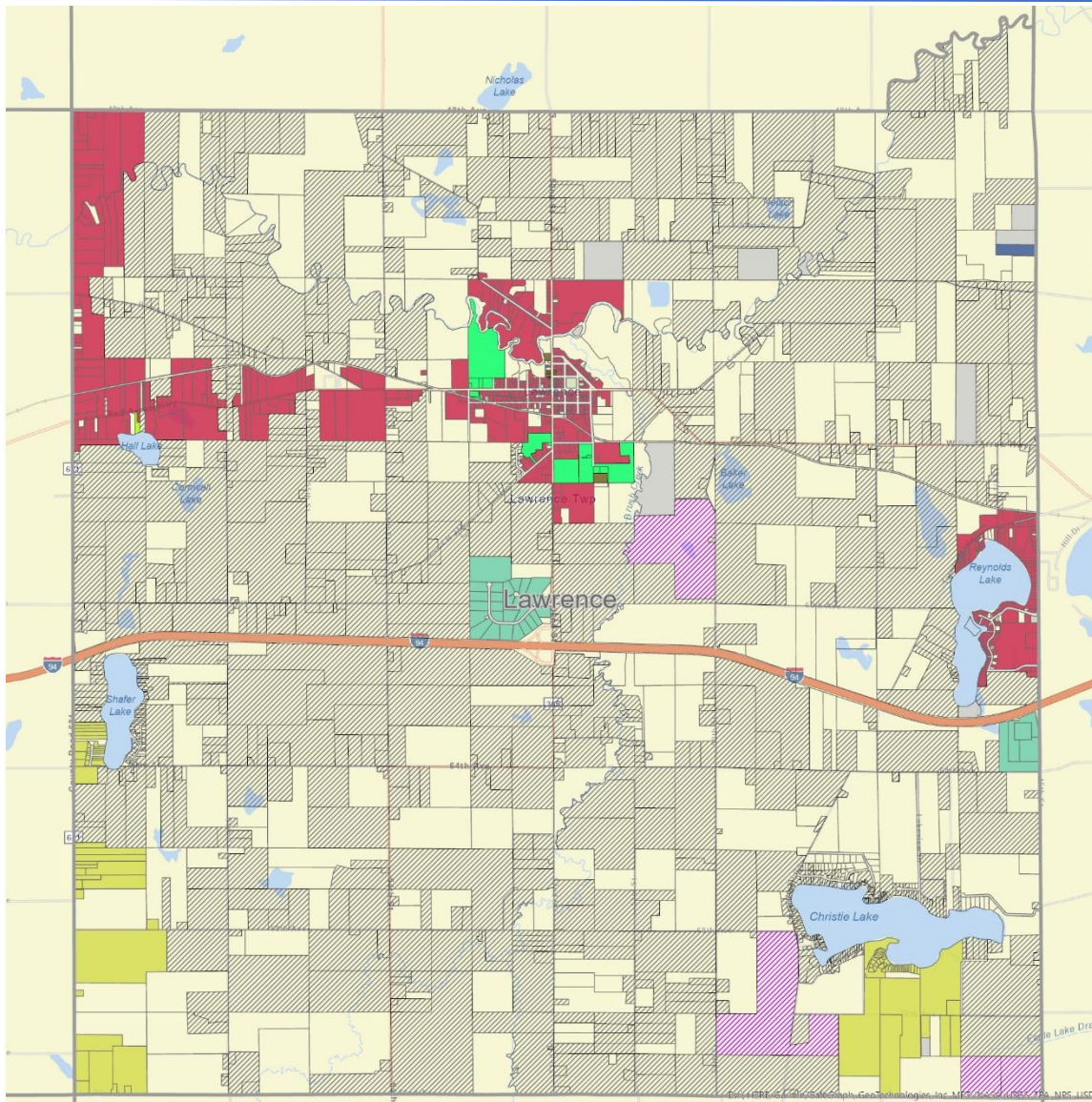
Decatur Township

Porter Township



Total Parcels	7820
Undeveloped/Unoccupied	1453
Occupied Parcels	6367
Unserved (including Ag)	1542
Served Parcels	4825
Grant Funded Parcels (approx.)	688
Gap Parcels	854

Lawrence Township is 59% unserved, the remaining three townships in District 6 are all at 10% to 15% unserved which is why Lawrence has over 93% of the RDOF funding awarded for this area. There is remaining Gap filling requirements for all four townships, and the total estimated budget for that is \$4.37M to \$8.56M.

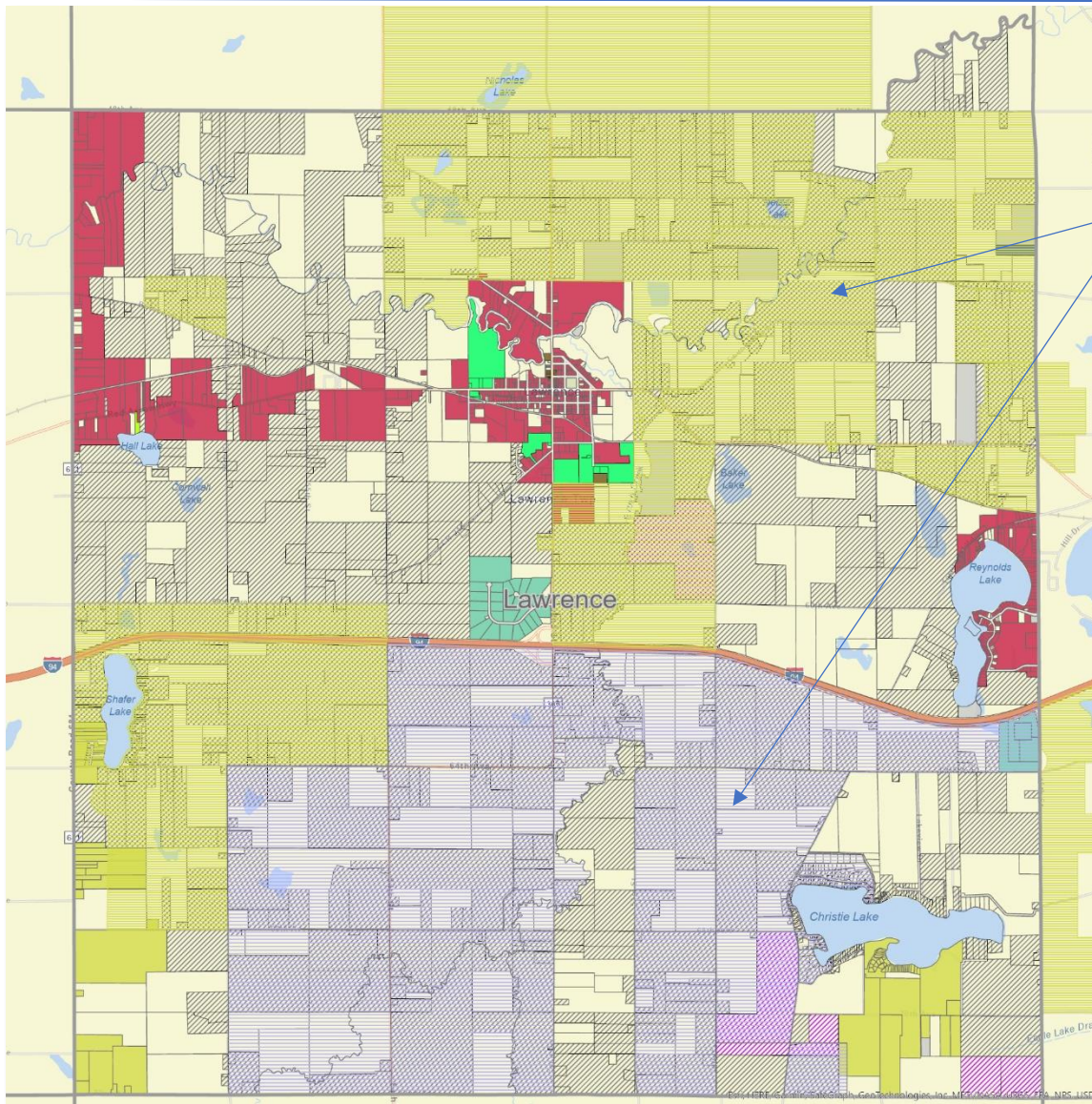


Lawrence Township

Total Parcels	2285
Undeveloped/Unoccupied	496
Occupied Parcels	1789
Unserved (including Ag)	1054
Served Parcels	735
Grant Funded Parcels (approx.)	645
Gap Parcels	409

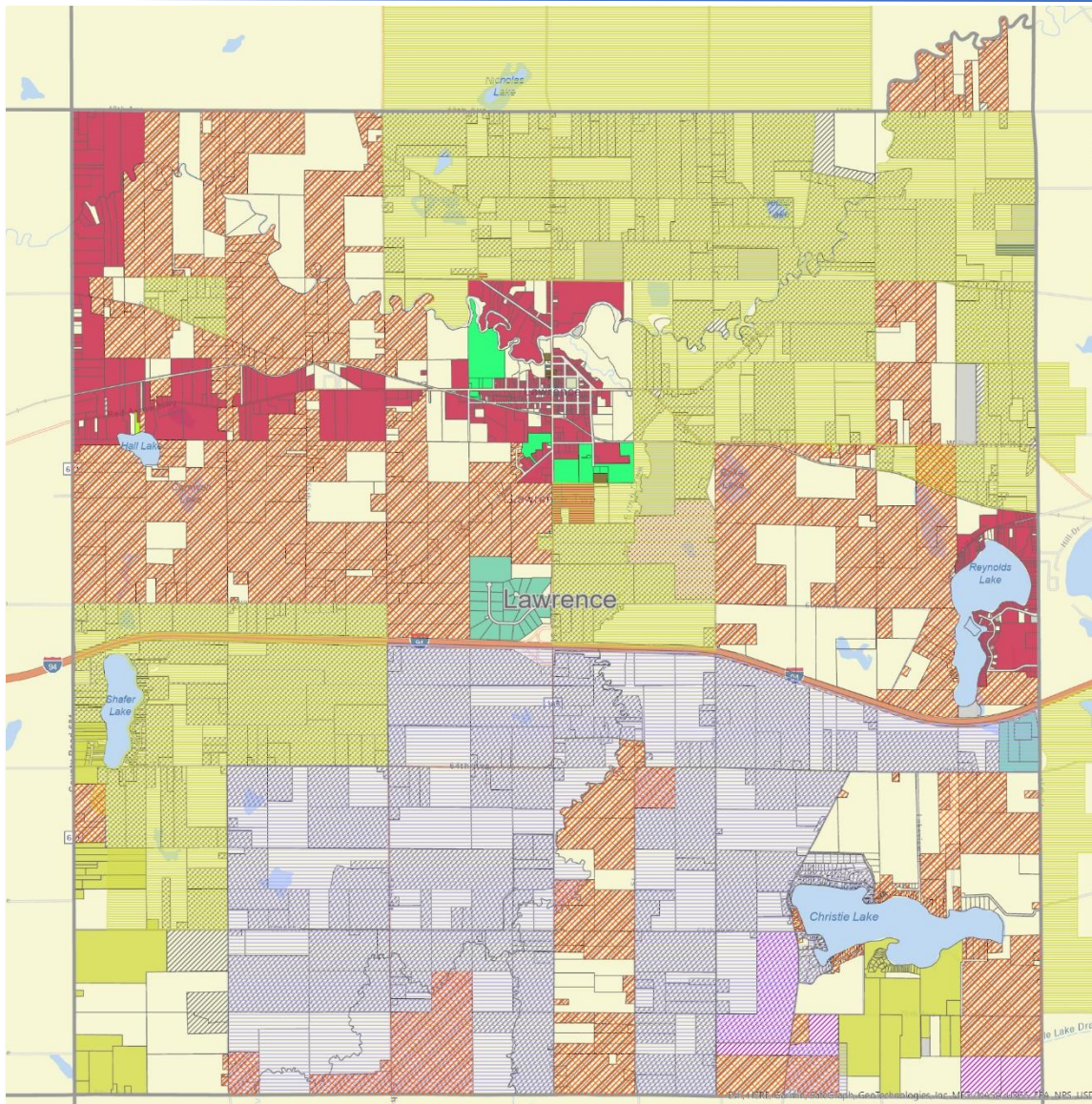
As shown on the map to the left, Lawrence Township is 59% unserved. That ratio would be much higher if you exclude the Village of Lawrence from the calculation. Fortunately RDOF has funded about 61% of the unserved areas, which means there is still much to do to get Lawrence Township 100% served.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



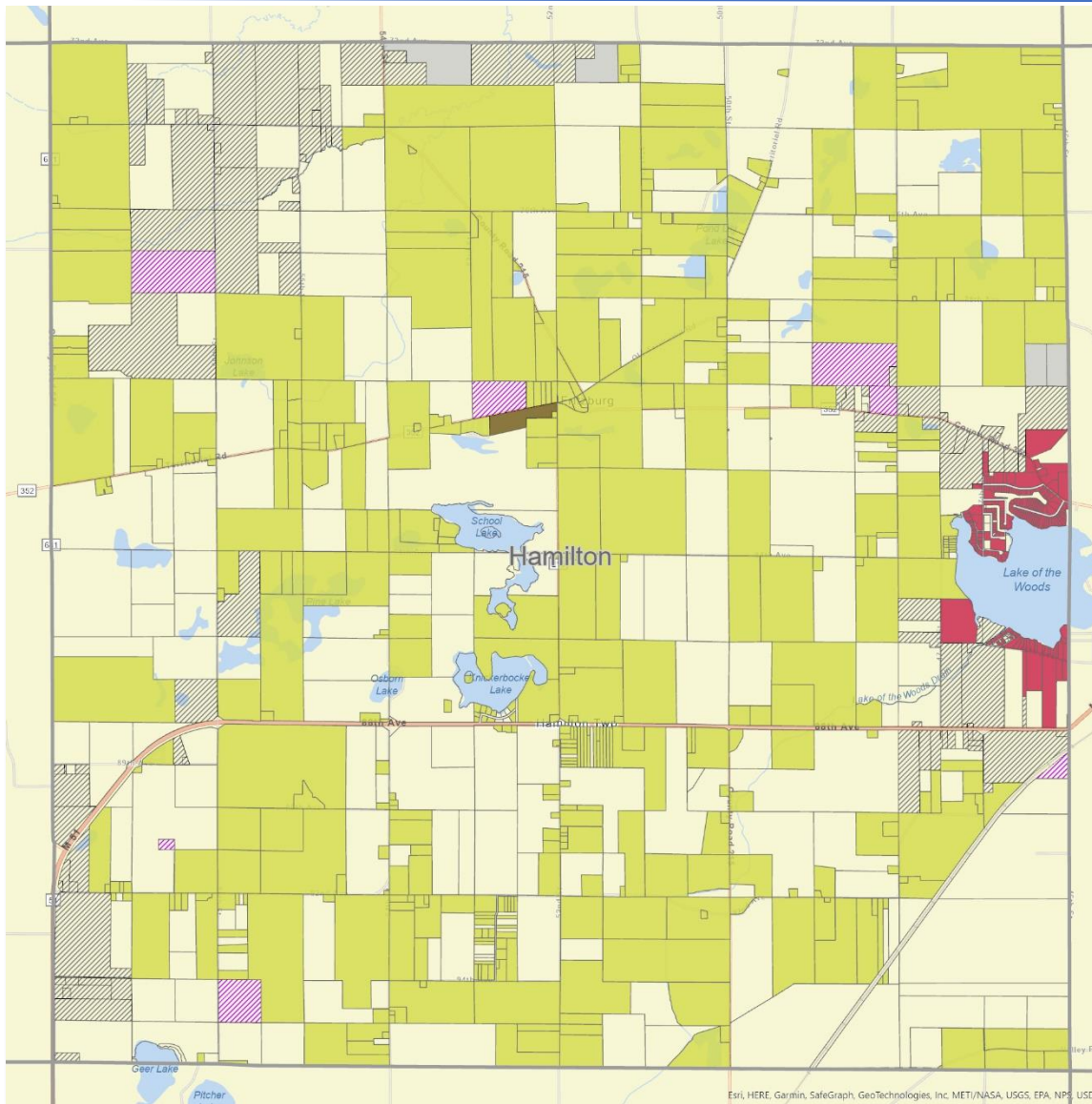
Current Grant Programs

RDOF awards were made to two ISPs in Lawrence Township, MEC (yellow hatch), who has some areas already serviced Lawrence Township, and newcomer, Mercury Broadband (light blue hatch). This will cover approximately 645 parcels, leaving about 409 to be funded separately.



Gaps still to be filled

The remaining 409 parcels can be approached a couple of ways. MEC and Comcast are both adjacent to most of the unserved parcels north of I-94, and MEC and Mercury are best positioned to reach the remaining unserved parcels south of I-94. An RFP process grouping all GAP parcels in this township may be appropriate given the three local providers are all in similar positions to extend to these areas. The estimated costs to fill all Gap parcels is \$2.25M to \$4.29M.

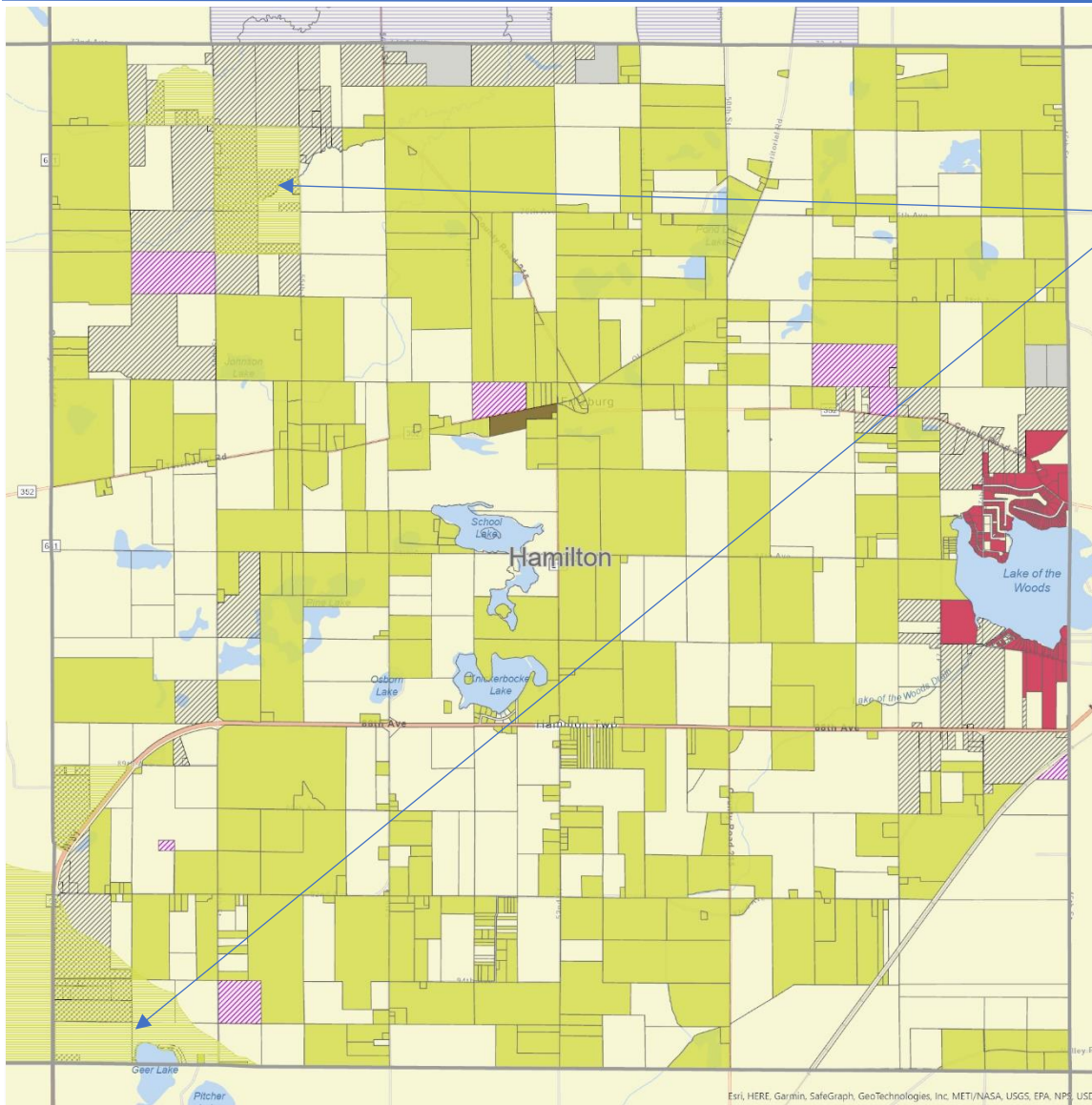


Hamilton Township

Total Parcels	1021
Undeveloped/Unoccupied	251
Occupied Parcels	770
Unservd (including Ag)	113
Served Parcels	657
Grant Funded Parcels (approx.)	11
Gap Parcels	102

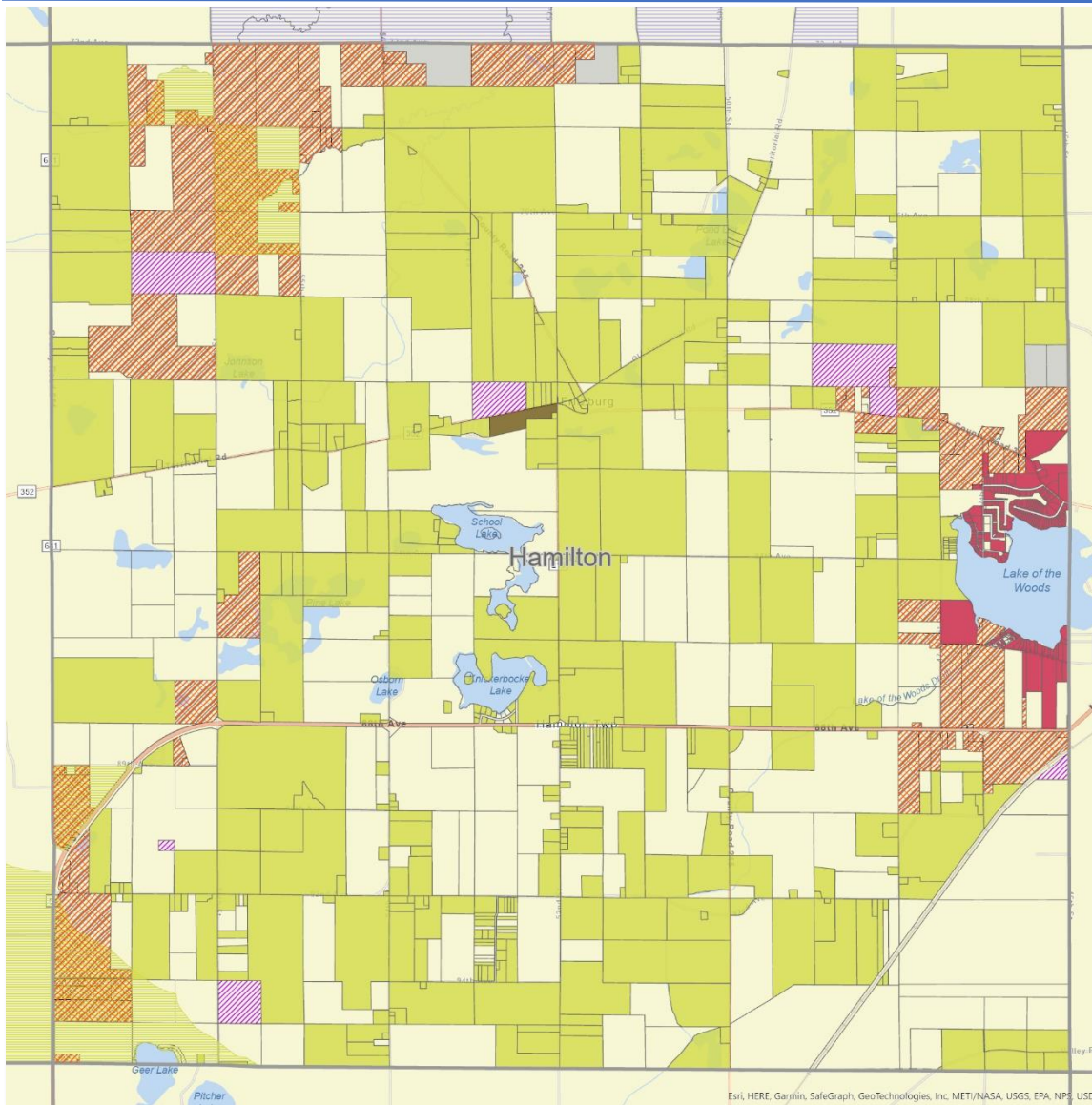
Hamilton Township is mostly servicable by MEC (yellow), with Comcast offering services around Lake of the Woods. The Gap areas are well defined, making it easy to develop a practical plan for getting them serviced.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



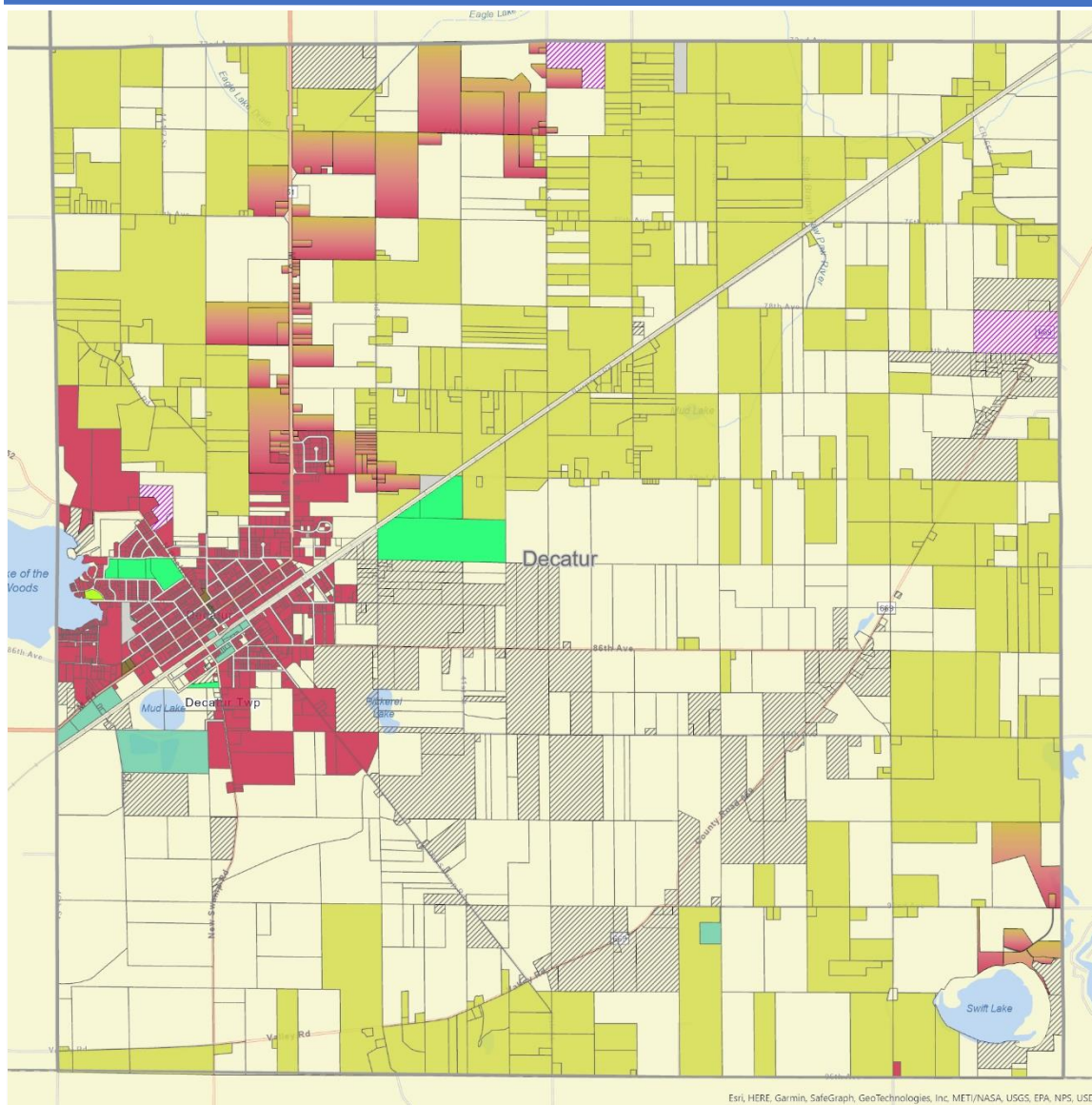
Current Grant Programs

RDOF has awarded a couple of small areas on the west side of the township, both to MEC and both within current existing MEC service areas.



Gaps still to be filled

All remaining Gap areas on the west side of the township are within existing MEC service areas, or MEC RDOF areas (or both). It would be most practical to explore filling these gaps with MEC, since they are all in proximity of each other. The Gap parcels on the east side of the township could be reached easily by Comcast or MEC, but the quantity is relatively small, less than 50. Direct negotiations with each ISP may be most practical. The estimated costs to reach all 102 Gap parcels in Hamilton County is between \$612K and \$1.07M.

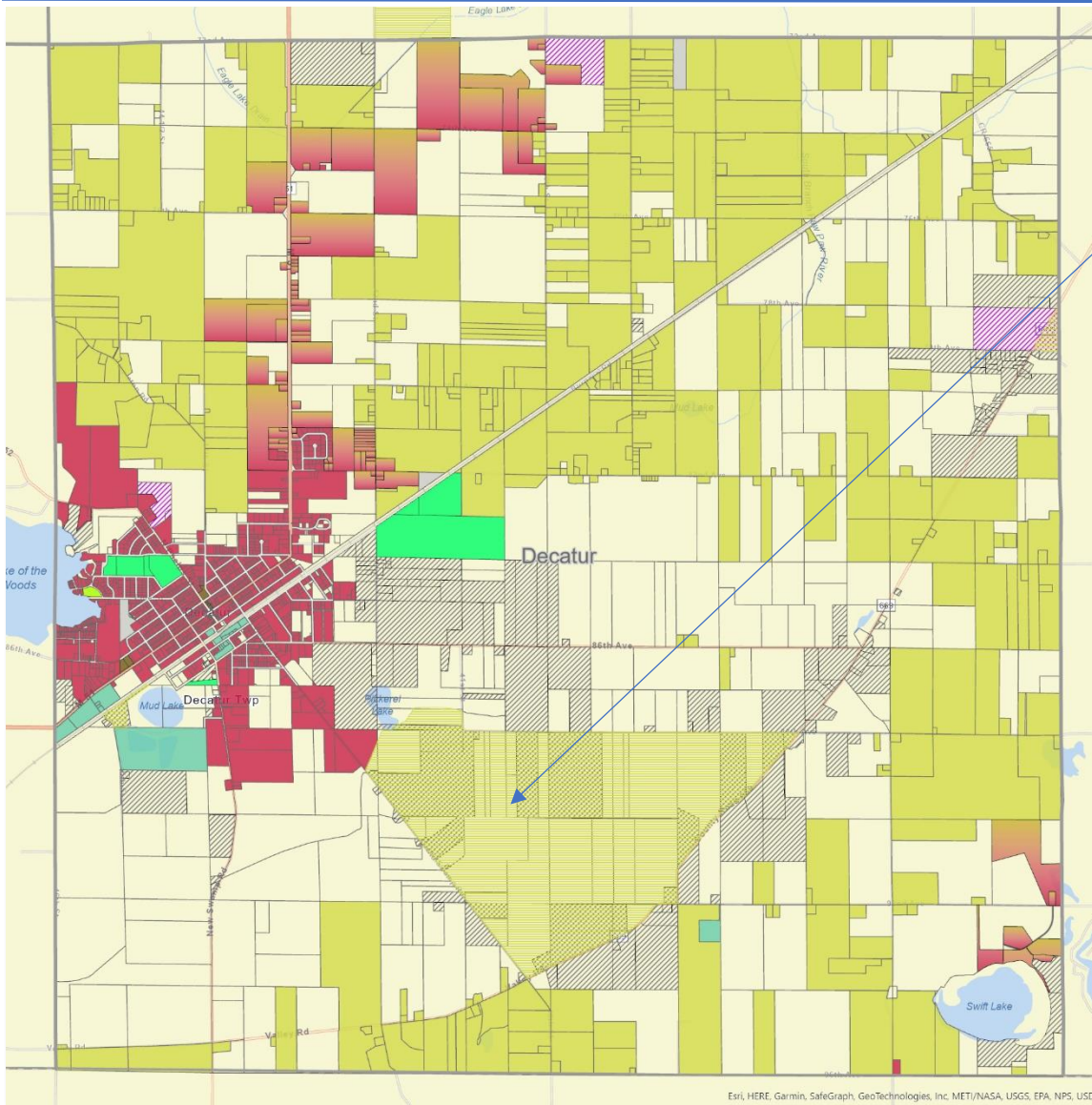


Decatur Township

Total Parcels	2248
Undeveloped/Unoccupied	394
Occupied Parcels	1854
Unserved (including Ag)	186
Served Parcels	1668
Grant Funded Parcels (approx.)	21
Gap Parcels	165

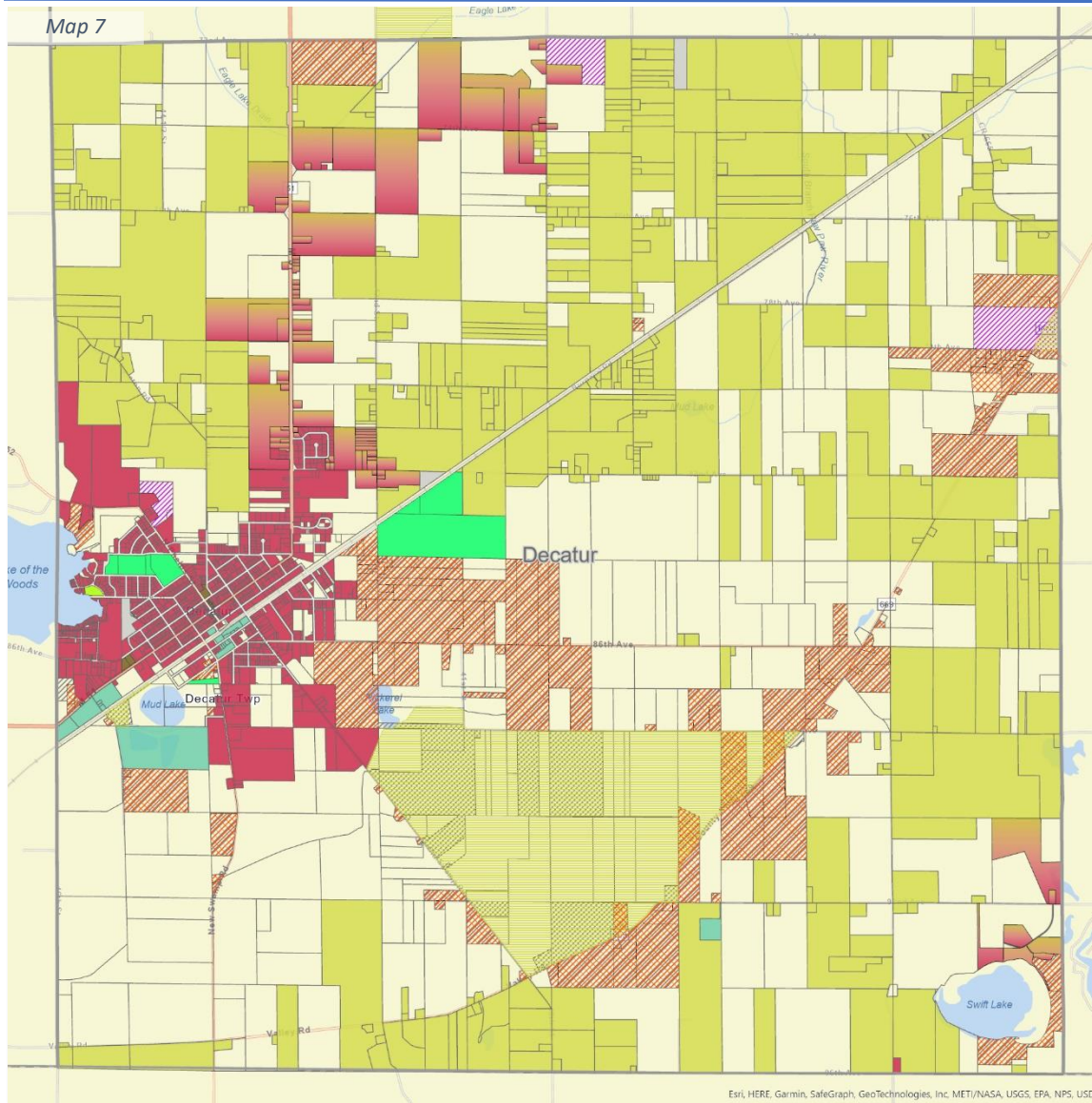
The Village of Decatur is almost entirely serviced by Comcast, and most of the Township is serviced by MEC. The M-51 corridor has both providers from the village limits to near the township border. 10% of the township is currently unserved, and only about 11% of those parcels are currently funded by any Grant programs.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



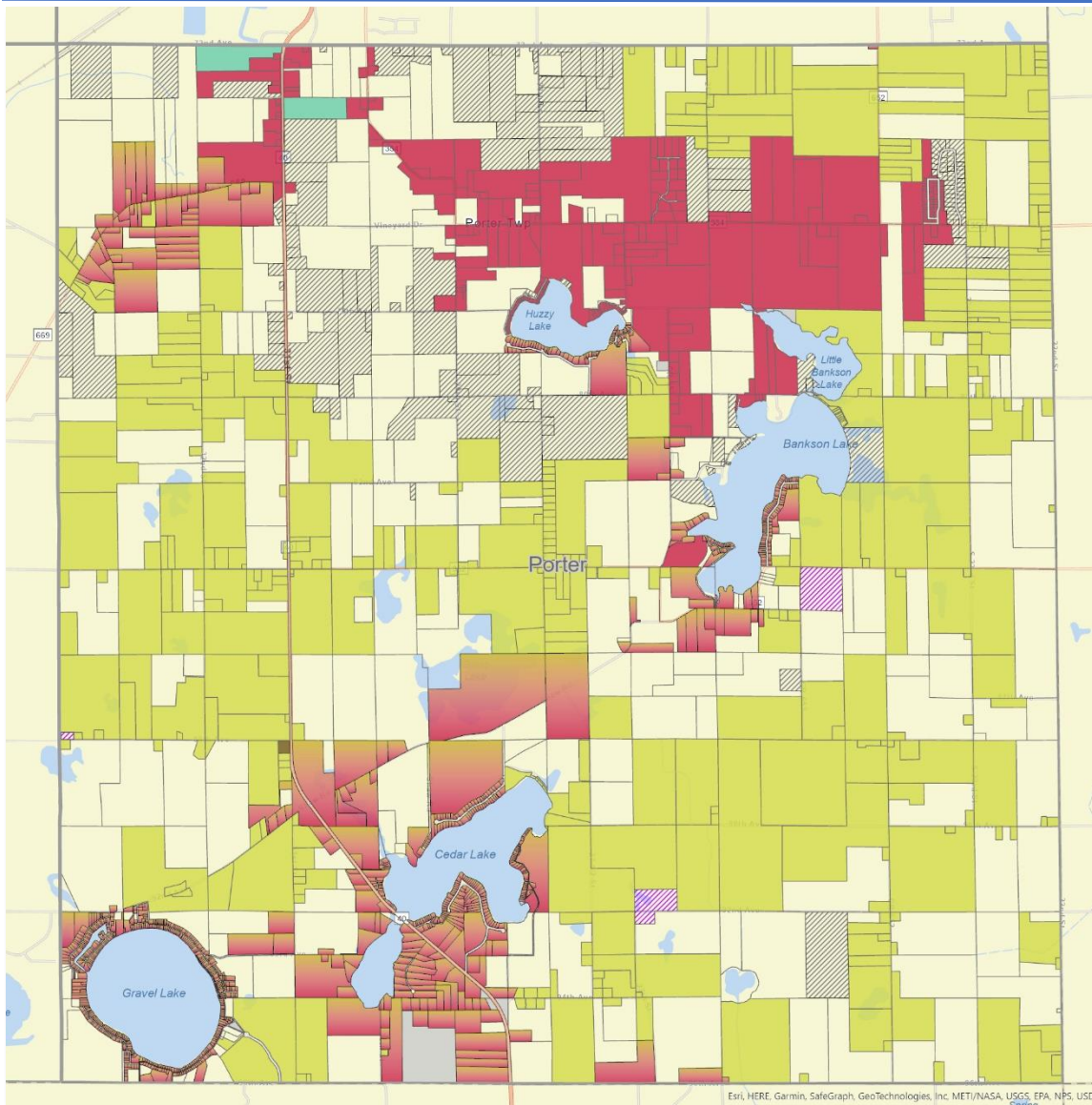
Current Grant Programs

Although the RDOF grant area (yellow hatch) looks fairly large, it covers mostly un-occupied farmland. The total RDOF grant is for about 20 parcels and was awarded to MEC. Note that the triangle shaped RDOF area is bordered on all three sides with unserved parcels on the opposite sides of the streets from the funded areas.



Gaps still to be filled

The triangle shaped RDOF area borders county road 669 along the southeast side, Old Swamp Rd on the southwest side and 88th Ave along the north boundary. Each of these roads have unserved parcels across the street from RDOF funded parcels. These situations should be taken into account when considering all Gap filling requirements in the county. The estimated cost for filling all Gaps left in Decatur Township is between \$660K and \$1.41M.

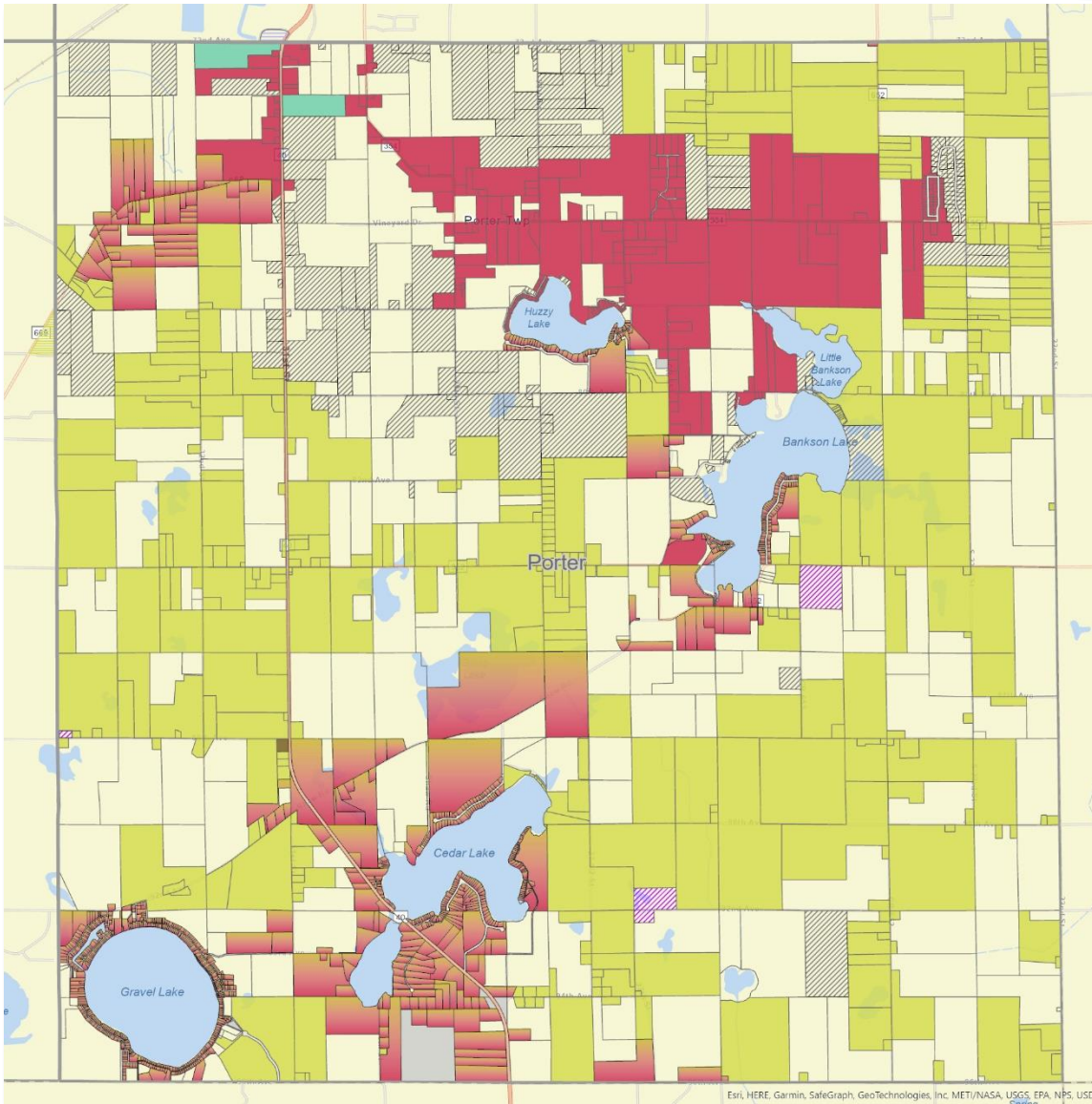


Porter Township

Total Parcels	2266
Undeveloped/Unoccupied	312
Occupied Parcels	1954
Unserved (including Ag)	189
Served Parcels	1765
Grant Funded Parcels (approx.)	0
Gap Parcels	189

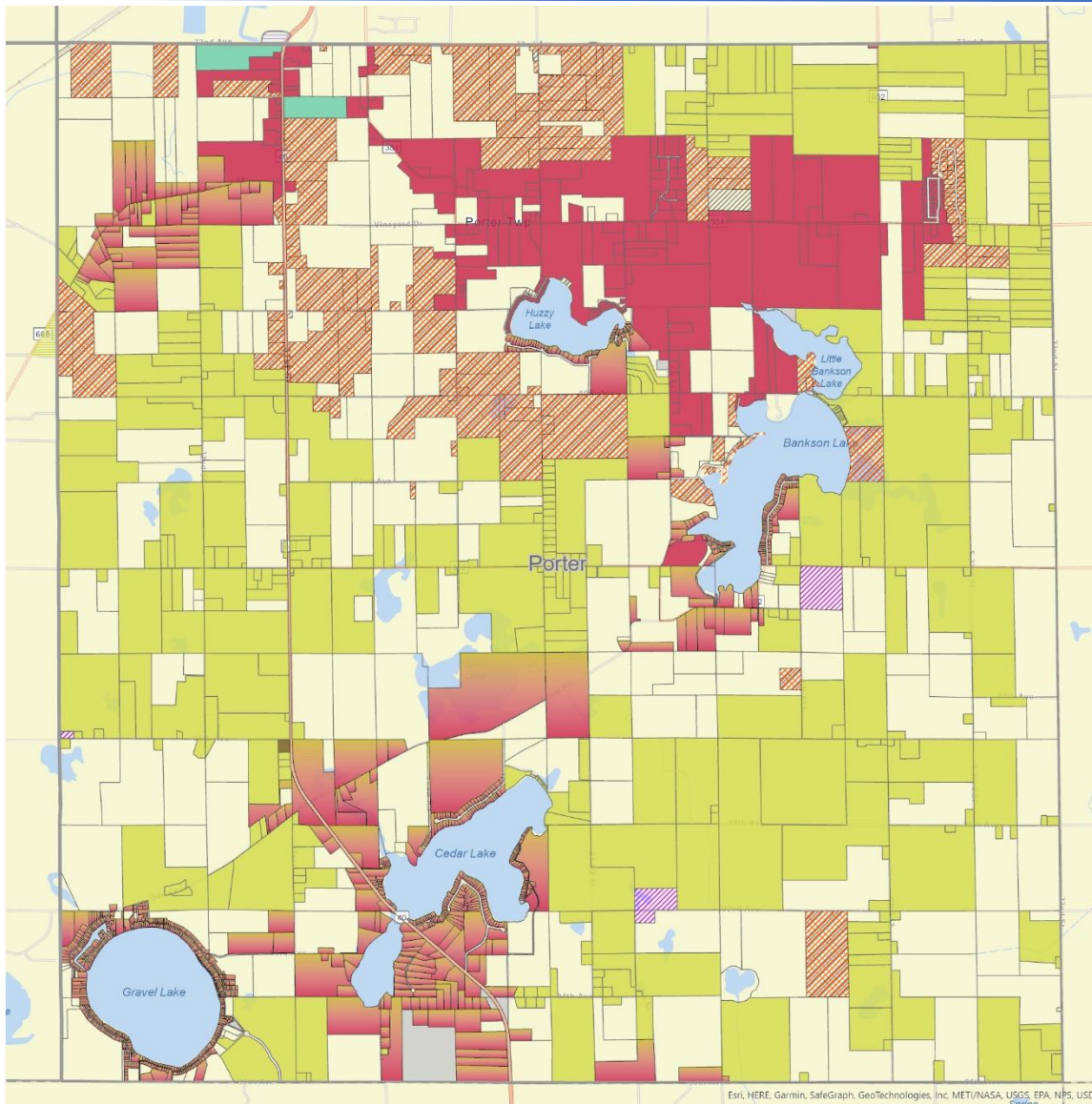
Porter Township is shared evenly between Comcast and MEC with only 10% of the community unserved. Most of the residents around the lakes, and along CR669 enjoy the benefit of having both ISPs available. Very little grant funding is available, and only 189 Gap parcels exist, most of which are grouped together, making it easier to plan for additional funding.

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



Current Grant Programs

Porter Township is the only township in Van Buren County with no existing Grant programs awarded for Broadband.



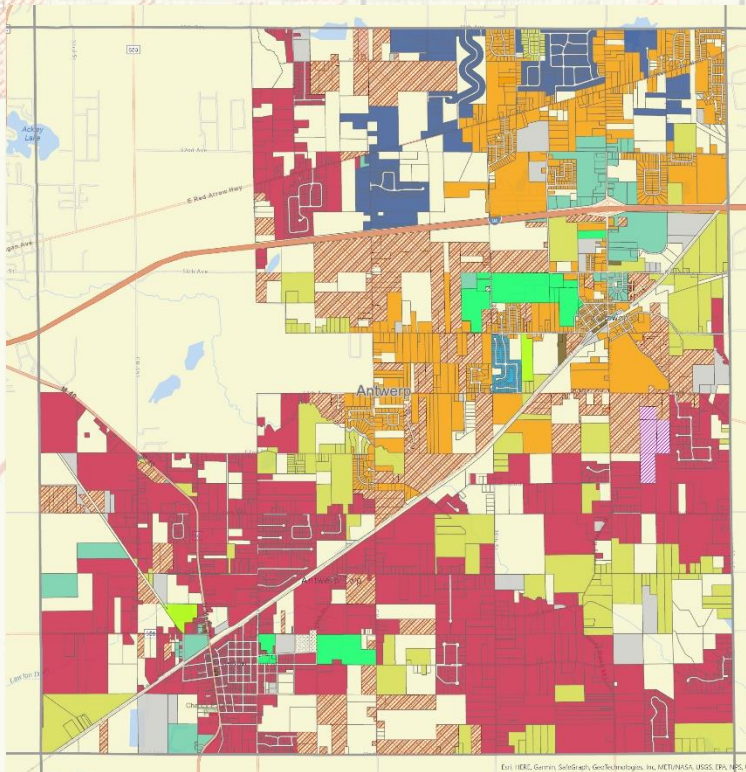
Gaps still to be filled

There are 189 parcels identified as unserved. There are a few parcels that are within an MEC only, or a Comcast only area, but most of the unserved Gap parcels are within reach of either ISP. With a couple of possible exceptions, a request for proposals from both ISPs to fill all remaining Gap parcels would likely yield a favorable plan. The estimated costs to complete all Gap parcel in Porter Township is between \$850K and \$1.79M.



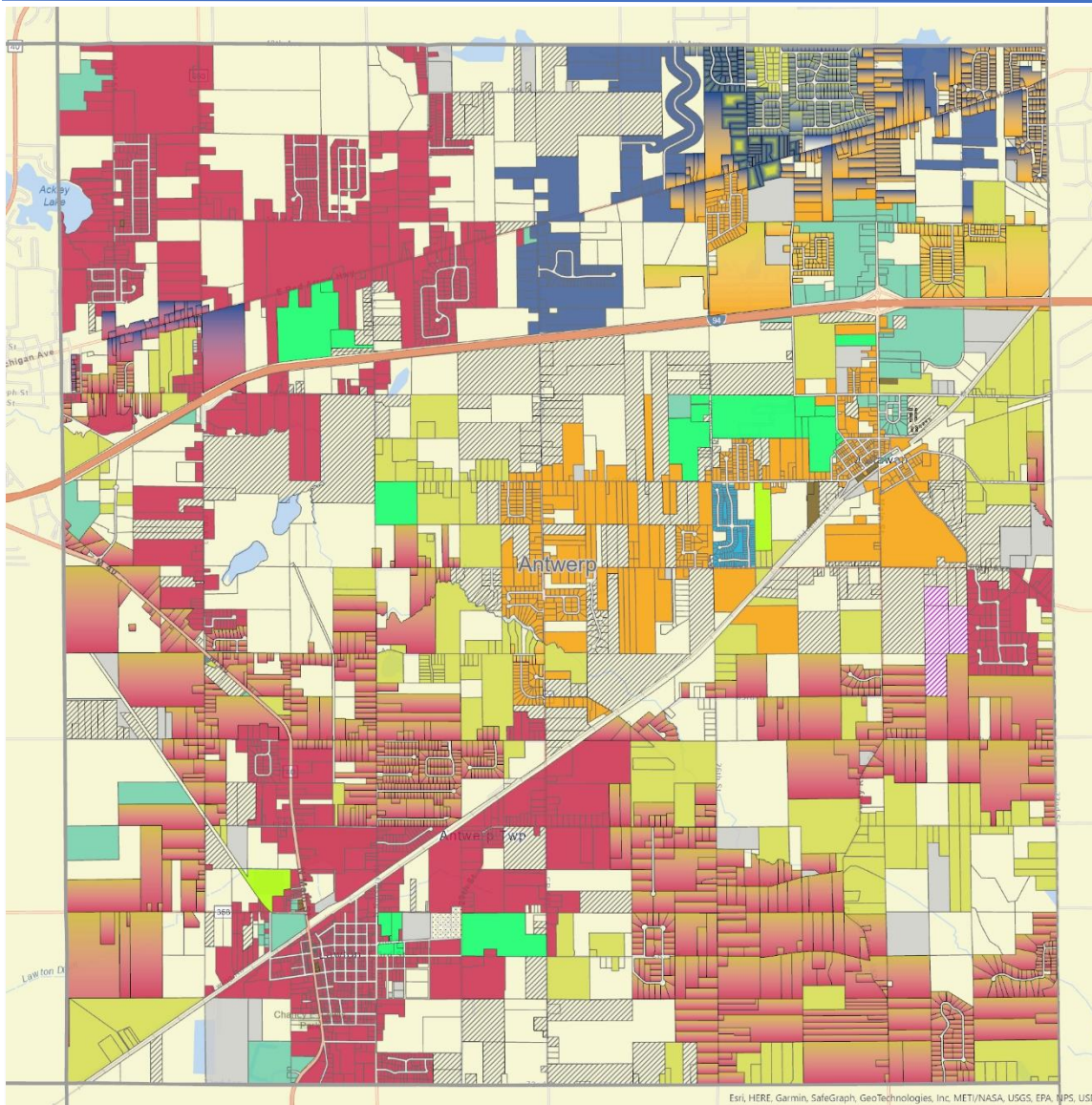
Commission District 7
Commissioner Paul Schincariol

Antwerp Township



Total Parcels	5845
Undeveloped/Unoccupied	463
Occupied Parcels	5382
Unserved (including Ag)	314
Served Parcels	5068
Grant Funded Parcels (approx.)	9
Gap Parcels	305

District 7 includes is exclusively within Antwerp Township, and does not include the entire township. But for the purpose of this report, Antwerp Township is summarized entirely in this section, including the portion that is part of District 5 (blank area in the map to the right) The estimated cost to fill all Gaps in District 5 is between \$660K and \$1.57M.

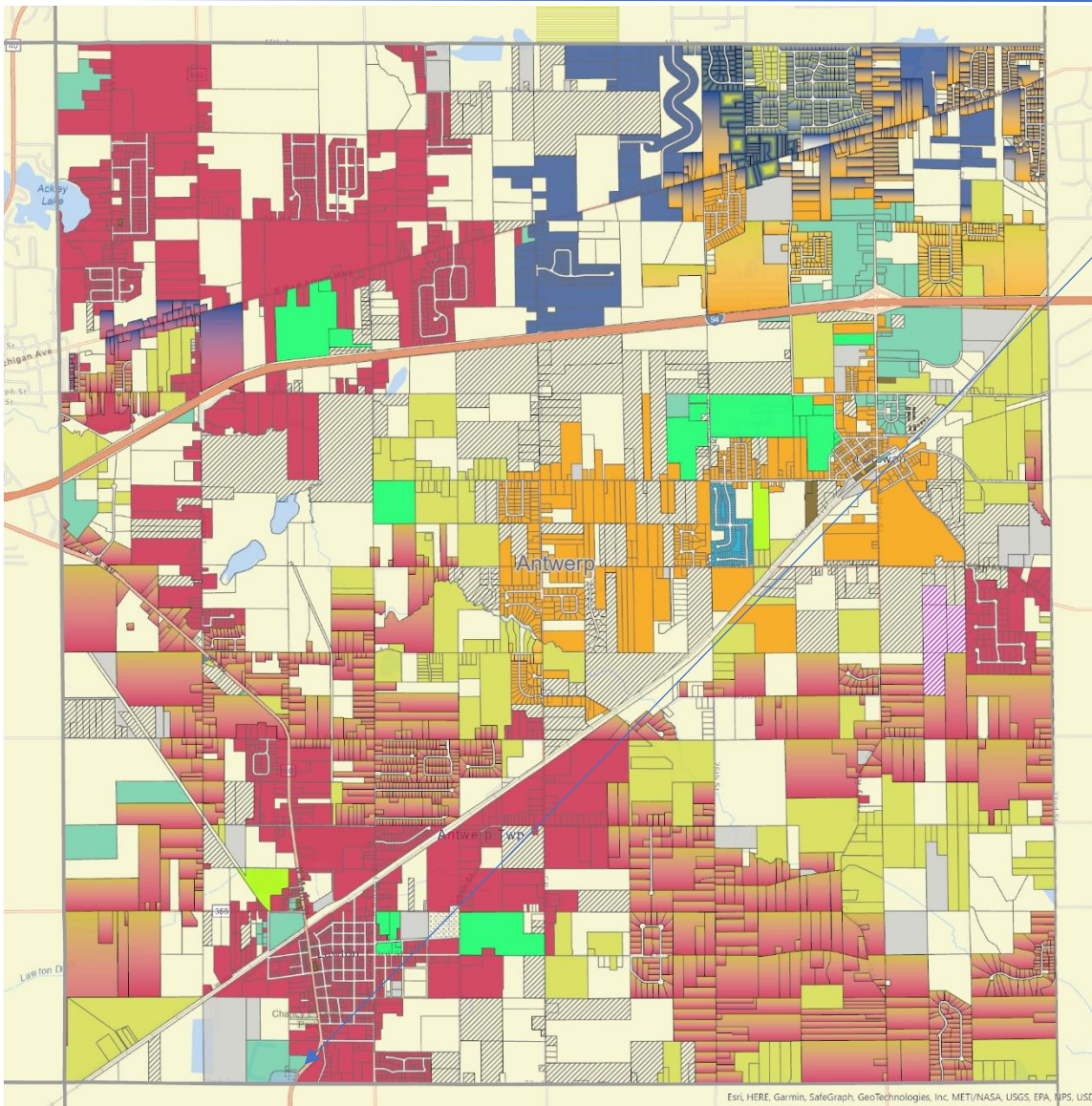


Antwerp Township

Total Parcels	5845
Undeveloped/Unoccupied	463
Occupied Parcels	5382
Unserved (including Ag)	314
Served Parcels	5068
Grant Funded Parcels (approx.)	5
Gap Parcels	309

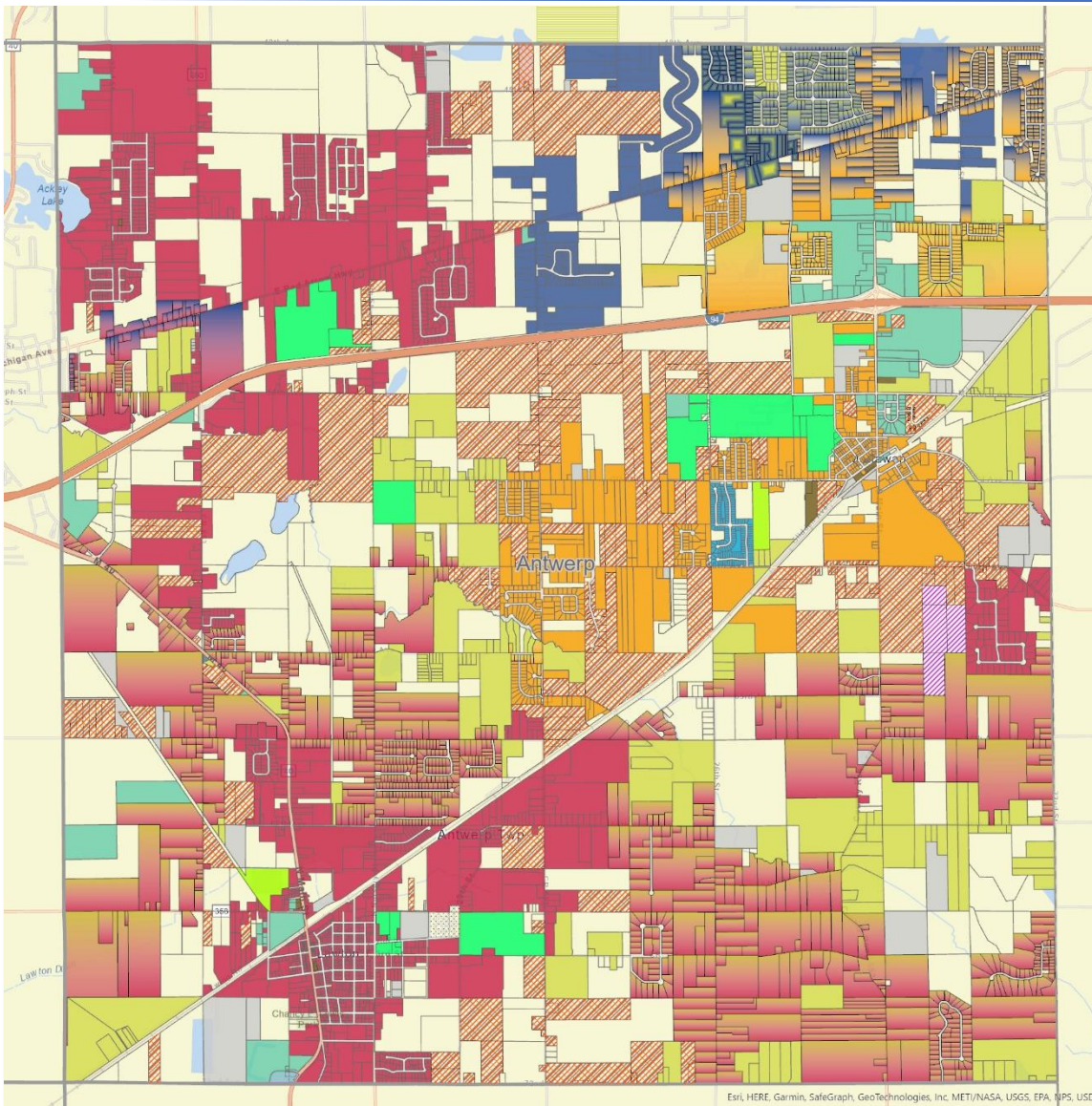
Antwerp Township is home to five different ISPs, many of them overlapping each other, in some cases three deep. Even with this density, Antwerp still has 6% of the community unserved, with grant funding awarded for just 5 parcels. The RDOF grant award for the 5 parcels is for the property that the Honee Bear Canning Company sits on in near the Village of Lawton (which doesn't help the Gap program much).

Service Provider Key	
Unoccupied (no address)	
Undeveloped (address)	
Unserviceable	
Agricultural (unserviceable)	
Gaps	
Comcast	
Charter	
MEC Fiber	
BCI Fiber	
AT&T Fiber	
Sister Lakes Cable	
Media Com	
Michiana Supernet	
BCI/MEC	
Comcast/MEC	
Comcast/BCI	
Mediacom/MEC	
Mediacom/BCI	
MEC & BCI (2nd & 3rd)	
MEC RDOF	
Mercury RDOF	
Charter RDOF	
BCI ReConnect	



Current Grant Programs

As mentioned above, an RDOF award was given to Mercury Broadband for a group of parcels occupied by the Honee Bear Canning company along the south edge of Lawton. For the purposes of planning for Gap filling of unserved areas, this can be disregarded.



Gaps still to be filled

Even though Antwerp Township has the highest presence of ISPs in the county, there are still 309 unserved Gap parcels that need to be addressed. Unfortunately, those parcels are woven throughout the county, and there is no clear practical way to serve them with a single plan. Each area will need to be evaluated based on proximity to existing ISPs. This will likely require several small agreements with ISPs. The estimated cost for Antwerp Gap Filling is \$2.16M to \$4.33M.



Appendix A – Definitions

There are several terms being used to discuss the topic of who has, and who cannot get access to Broadband Internet in various circles. The term Broadband itself has several definitions. For this report, following are clarifications for the use of some of these terms within this report.

bit – A single data bit which is the unit measured relative to time for measuring the speed of data connections. A bit is indicated by a small case “b.”

Byte – Typically a packet or group of 8 or more bits, typically not used in measuring connection speed, but more as a measure for capacity, such as in Hard Drives or monthly download limits when data caps are part of a service package. A Byte is indicated by an upper case “B”.

Kb/s – Kilobits per second, sometimes abbreviated as Kbps. 1,000 data bits (not Bytes) per second

Mb/s – Megabits per second, sometimes abbreviated as Mbps. 1,000,000 data bits per second

Gb/s – Gigabits per second, sometimes abbreviated as Gbps. 1,000,000,000 data bits per second

Broadband – within this context, Broadband shall mean anything equal to or above the FCC established minimum of 25 Mb/s download speed and 3 Mb/s upload.

Cable – Or Cable Modem, a coax or hybrid fiber coax (HFC) network design capable of Broadband data speeds up to several hundred Megabits per second, with emerging technology that can reach into Gigabit per second speeds.

ISDN – Integrated Services Digital Network, an early development in digital transmission methods for copper telephone lines, it supported early data networking and video conferencing over phone lines and is the predecessor to DSL.

DSL – Digital Subscriber Line, a copper twisted pair technology using traditional telephone lines to deliver high speed data connections, but is highly susceptible to distance limitations, condition of the copper cabling, and overall network usage. Most DSL subscribers are not able to receive minimum Broadband speeds.

Fixed Wireless – Primarily cellular telephone providers that offer data services over various wireless (cellular) technologies. The prevalent technology today is 4G LTE (has different variations) and can offer Broadband speeds depending upon a subscriber’s proximity to the providers antenna towers or micro-cells. However, most fixed wireless subscribers cannot receive minimum Broadband speeds from fixed locations, such as their homes if they are not located close enough to the providers facilities.



FTTH – Fiber to the Home, a network architecture using Passive Optical Network (PON) technologies to provide Gigabit speed data connections. It may be abbreviated as FTTx with the “x” meaning that there can be different variations of how the network is designed.

Served or Access – Homes and businesses that have access to, but not necessarily connected to a technology that can provide Broadband connectivity throughout its service area. For this report, only Cable Modem and FTTH qualify as being able to fully offer Broadband services in “Served” areas.

Unserved or No Access – Homes and businesses that may have access to DSL or Fixed Wireless, but not Cable or FTTH. Also applies to rural areas that have no access to any potential Broadband provider other than Satellite, which itself cannot consistently offer Broadband speeds.

ROW – Right of Way, pertaining to the typically 60’ to 66’ of road easement that is maintained by WCRC or MDOT. Paved or graded portions of roads do not always line up with the center of the ROW, so some survey work may be required to establish exact ROW boundaries for permitting requirements if contemplated for burying fiber optic cables.

MDOT – Michigan Department of Transportation

LCRC – Leelanau County Road Commission

PON – Passive Optical Network

GPON – Gigabit Passive Optical Network

OLT – Optical Light Termination, the device at the headend of a Passive Optical Network providing the connectivity for the fiber

SFP OIM – Small Form Pluggable Optical Interface Module, a small module inserted in the OLT providing the proper fiber optic termination type

Notes: